DRAFT ENVIRONMENTAL IMPACT REPORT
TECHNICAL APPENDICES

HARBOR GATEWAY CENTER

EIR No. 96-0090-SUB(ZV)(CUB)(DA)
State Clearinghouse No. 96051050

February 6, 1997

CITY OF LOS ANGELES

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APPENDIX A

MITIGATION MONITORING AND REPORTING PROGRAM

PROCEDURES

The Developer shall be obligated to provide certification, as identified below, to the appropriate monitoring agency and the appropriate enforcement agency prior to the issuance of site or building plans that compliance with the required mitigation measures has been effected. All departments listed below are within the City of Los Angeles unless otherwise noted. The responsible agency shall be the project applicant for all mitigation measures unless otherwise noted.

MONITORING AND REPORTING PROGRAM

A. EARTH

1. All grading shall be performed in accordance with the current City of Los Angeles Building Code and the requirements of the responsible agencies including, but not limited to, the Department of Building and Safety and the Bureau of Engineering.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

2. No on-site grading or import or export of earth materials to the project site shall commence or be performed without first obtaining a permit from the Los Angeles Department of Building and Safety. In accordance with Section B-164 of the Building and Safety Code, the following shall be conducted prior to issuance of a grading permit: (1) grading plans and specifications meeting all Department of Building and Safety requirements shall be prepared; and (2) evidence shall be provided that adjacent property owners have received a 30-day written notice of any pending excavation work to a depth deeper than the foundation of adjoining buildings and located closer to the property line than the depth of excavation.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. Grading and excavation operations shall be conducted under the observation of a registered soils engineer or geologist. Grading plans for the site shall conform to the General Specifications for all Grading Plans promulgated by the City of Los Angeles Department of Building and Safety.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

4. Vegetation and demolition debris shall be removed and hauled from the site prior to the start of grading operations.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. Any existing low density soils and/or saturated soils shall be removed under the inspection of the soils engineer/geologist. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90 percent relative compaction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

6. Overexcavation shall extend a minimum of five horizontal feet beyond all sides of the foundations or a distance equal to the depth of compacted fill placed, whichever is greater.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. Any underground structures or utility lines encountered during grading shall be either removed or properly abandoned prior to the start of construction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. Any imported fill material shall be low to moderate in expansion potential, preferably granular or similar to the upper soils encountered at the project site.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. Any imported fill material shall be approved by the project soils engineer/geologist.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

10. Approved fill soils shall be placed in layers not in excess of six inches in thickness.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

11. Each lift shall be uniform in thickness and thoroughly blended, compacted to a minimum of 90 percent relative compaction, and approved by the soils engineer/geologist prior to the placement of the next layer of soil.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

12. Fill soils shall be brought to within 15 percent of the optimum moisture content, unless otherwise specified by the soils engineer/geologist.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

13. Compaction tests shall be conducted at a minimum of one test for every 500 cubic yards placed and/or for every two feet of compacted fill placed.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

14. Final grade of structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

15. Minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

16. No fill soils shall be placed, spread or compacted during unfavorable weather conditions.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

17. When grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the soils engineer/geologist.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

18. Adequate lateral support shall be provided for all adjacent improvements and structures at all times during grading operations and throughout the construction phase.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

19. The project structural engineer shall review all proposed loads to be imposed for further recommendations regarding slab thickness and steel reinforcement.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

20. All retaining walls shall include a backfill zone of non-expansive material, consisting of a wedge beginning a minimum of one horizontal foot from the base of the retaining wall and extending upward at an inclination no less than 3/4 to 1 (horizontal to vertical).

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

21. All retaining walls shall be waterproofed and protected from hydrostatic pressure by a reliable permanent subdrain system.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

22. All concrete slabs-on-grade shall be a minimum of five inches in thickness, reinforced a minimum of No. 4 bars eighteen inches in each direction, and positioned in the center of the slab.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

23. Any concrete slabs with moisture sensitive floor coverings shall be underlain by an impervious membrane.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

24. All concrete slab areas to receive floor coverings shall be moisture tested to meet all manufacturer requirements prior to placement.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

25. Additional sulfate testing shall be performed at the conclusion of the rough grading operation to determine if special cement is required. If a high sulfate concentration is found, a non-corrosive cement mix such as Type 5 shall be used.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

26. Design and construction of the proposed project shall include all requirements of the City of Los Angeles Building Code with respect to seismic safety and shall be approved by the City Department of Building and Safety prior to the issuance of building permits.

Monitoring Phase: Pre-Construction
Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

27. To assist in response to a seismic event, an emergency response and building-specific evacuation plan for project structures shall be developed and posted in each on-site building at the site. Such information shall be disseminated to occupants to reduce the potential for human injury.

Monitoring Phase: Pre-Occupancy
Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

B. AIR QUALITY

1. The Applicant shall secure any necessary permits from the SCAQMD, including an approved fugitive dust emissions control plan pursuant to SCAQMD Rule 403, as amended.

Monitoring Phase: Pre-Construction
Enforcement Agency: South Coast Air Quality Management District
Monitoring Agency: Department of Building and Safety

2. Non-toxic soil stabilizers shall be applied according to manufacturers' specifications or vegetation shall be planted on all inactive construction areas (previously graded areas inactive for thirty days or more and not scheduled for additional construction activities within twelve months). Permanent landscaping shall be installed upon completion of construction.

Monitoring Phase: Construction
Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

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3. Areas graded shall be wetted down sufficiently to form a crust on the surface, with repeated soaking as necessary to maintain the crust and to prevent dust from being raised by on-site operations, using water trucks or sprinkler systems. Further, construction areas shall be wetted down in the late morning or after work is completed for the day.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

4. All grading activities shall cease during second stage smog alerts and periods of high winds (i.e. greater than 25 mph) if dust is being transported to off-site locations and cannot be controlled by watering.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer).

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

6. A construction relations officer shall be established by the Applicant to act as a liaison with neighbors and residents concerning on-site construction activity, including resolution of issues related to PM_{10} generation.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. All construction roads within the project site that have a traffic volume of more than 50 daily trips by construction equipment, or 150 total daily trips by all vehicles, shall be surfaced with base material or decomposed granite.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. Streets shall be swept at the end of the day if visible soil material has been carried onto adjacent public paved roads (reclaimed water shall be used if available).

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. Construction equipment shall be inspected prior to leaving the site and loose dirt shall be washed off with wheel washers as necessary.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

10. Water or non-toxic soil stabilizers shall be applied, according to manufacturers' specifications, as needed to preclude off-site transport of fugitive dust from all unpaved staging areas and unpaved road surfaces.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

11. Traffic speeds on all unpaved roads shall not exceed 15 mph.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

12. The Applicant or future owners of property within the project subdivision shall provide public education regarding the importance of reducing vehicle miles traveled and the related air quality impacts through the use of brochures, classes, and other informational tools.

Monitoring Phase:	Occupancy
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

13. On-site office/industrial park development shall provide preferential parking for high occupancy vehicles and alternative fuel vehicles, as well as other forms of parking management that would encourage higher vehicle occupancy rates.

Monitoring Phase:	Occupancy
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

14. Project occupants shall comply with SCAQMD Rule 2202, which applies to any employer who employs 100 or more employees on a full or part-time basis at a worksite. This rule, which aims to reduce volatile organic compounds (VOCs), NO_x, and CO, provides employers a menu of options that they can choose from to implement and meet the emission reduction target for their worksite.

Monitoring Phase:	Occupancy
Enforcement Agency:	South Coast Air Quality Management District
Monitoring Agency:	Department of Transportation

15. The Applicant or future owners within the project subdivision shall, as feasible, schedule deliveries during off-peak periods in order to encourage the reduction of trips during the most congested periods.

Monitoring Phase:	Occupancy
Enforcement Agency:	Bureau of Engineering
Monitoring Agency:	Bureau of Engineering

C. SURFACE WATER

1. The Applicant shall prepare detailed flood control plans for the City of Los Angeles Department of Public Works and Los Angeles County Flood Control District, including hydrology/hydraulic calculations and drainage improvement plans, showing quantitatively how projected stormwater runoff would be adequately conveyed to off-site storm drain facilities. Such plans shall be approved by the City and LACFCD prior to issuance of building permits.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Bureau of Engineering
Monitoring Agency:	Bureau of Engineering

2. All major and minor drainage infrastructure shall be designed and constructed per applicable design standards. All designs shall be submitted to the City of Los Angeles Department of Public Works for review and approval, prior to issuance of building permits.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. The Applicant shall implement on-site retention that is capable of retaining the difference between runoff from the 50 year storm and discharge of 1.0 cfs per acre.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Bureau of Engineering
Monitoring Agency:	Bureau of Engineering

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In order to avoid piecemeal effects, all lots approved under Tract 52172 shall comply with the following three mitigation measures regardless of size.

4. Prior to issuance of grading permits, the Applicant shall file a Notice of Intent with the State Water Resources Control Board and shall develop and implement a Storm Water Pollution Prevention Plan, monitoring program, and reporting plan for the construction period, in accordance with National Pollution Discharge Elimination System general construction permit requirements.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Regional Water Quality Control Board
Monitoring Agency:	Regional Water Quality Control Board

5. The Applicant shall conduct inspections of the site before and after storm events to determine whether control practices to reduce pollutant loadings identified in the Storm Water Pollution Prevention Plan are adequate and properly implemented.

Monitoring Phase:	Occupancy
Enforcement Agency:	Regional Water Quality Control Board
Monitoring Agency:	Regional Water Quality Control Board

6. Future projects within the office/industrial park component of the proposed project shall comply with the requirements of the NPDES general permit for solid waste discharges. Compliance shall be certified by the Regional Water Quality Control Board prior to issuance of building permits.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Regional Water Quality Control Board
Monitoring Agency:	Regional Water Quality Control Board

D. PLANT LIFE

1. All existing on-site trees (32 trees) that would be removed in conjunction with project buildout shall be replaced at a minimum ratio of 1:1.

Monitoring Phase:	Construction, Post-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of City Planning

2. All open areas on-site that are not used for buildings, walkways, and other hardscape shall be landscaped.

Monitoring Phase:	Post-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of City Planning

E. NOISE

1. On-site construction activity that generates noise in excess of 75 dBA at a distance of 50 feet shall be limited to between 7:00 A.M. and 6:00 P.M. Monday through Friday and 8:00 A.M. and 6:00 P.M. on Saturdays.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

2. All construction equipment shall be in proper operating condition and fitted with standard factory silencing features.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. Sound blankets shall be used on all construction equipment for which use of sound blankets is technically feasible.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

4. A construction relations officer shall be established by the applicant to act as a liaison with neighbors and residents concerning on-site construction activity. If noise levels from construction activity are found to exceed 75 dBA at the property line and construction equipment is left stationary and operating for more than one day, a temporary noise barrier shall be erected between the noise source and receptor.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. Any other noise reduction measures deemed technically feasible by the City of Los Angeles at the time of any specific construction project shall be implemented.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

6. During construction, the project shall comply with applicable Sections 112.03 of City Noise Ordinance Nos. 144,331 and 161,574 and subsequent ordinances.

Monitoring Phase:	Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. In order to ensure a suitable interior noise environment in all on-site uses, appropriate sound attenuation features shall be incorporated into the design of any retail uses proposed within 200 feet of 190th Street, any industrial park uses proposed within 100 feet of either Western Avenue or Normandie Avenue, and any office uses proposed within 400 feet of either Western Avenue or Normandie Avenue. Such features as closed windows and fresh air supply systems or air conditioning will normally suffice.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. A minimum 8-foot high thematic wall shall be constructed between the southern boundary of Area 2 and adjacent residential properties as individual lots in this area are developed. Graffiti resistant paint shall be utilized on both sides of the wall.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. Buildings within lots located adjacent to the residential area south of the project site shall be set back a minimum of 25 feet from the southerly property boundary of the project site.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of City Planning

F. LIGHT AND GLARE

F.1 Light

1. The project applicant shall comply with all applicable exterior lighting limitations of the City of Los Municipal Code.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

2. All outdoor lighting shall be shielded and directed downward to the greatest extent possible taking into account the function of the proposed lighting.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. Mercury-vapor street light fixtures shall not be utilized on any public or private streets included within the project.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

4. Mercury-vapor exterior light fixtures shall not be utilized for outdoor lighting, unless substantial evidence supporting the need for mercury-vapor is presented to the Department of Building and Safety.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. Effective structural and/or vegetative screening shall be provided between sensitive land uses (i.e., the 203rd Street residential area) and all parking lot/structure lighting or other large area, high-intensity broadcast lighting sources.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

6. Exterior lighting shall be designed such that illumination is confined to the project site or confined to areas which do not include sensitive uses.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. Exterior windows shall be tinted or contain a light-reflective film to reduce visible illumination levels from the building. Windows facing residential areas shall be constructed such that they are not allowed to be opened. Developers of future projects within the proposed subdivision shall consult with the Department of Water and Power regarding light-reflective film which would not interfere with energy conservation goals.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. Within 300 feet of the property lines of adjacent residences on the north side of 203rd Street, on-site building height shall be limited to 45 feet.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. A minimum 8-foot high thematic wall shall be constructed between the project site and adjacent residential properties to the south. Graffiti resistant paint shall be utilized on both sides of the wall.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

10. Buildings shall be set back a minimum of 25 feet from the southerly property line of the project site.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of City Planning

G. LAND USE

1. The applicant shall comply with all conditions for the Conditional Use Permit for FAR averaging.

   Monitoring Phase: Pre-Construction
   Enforcement Agency: Department of City Planning
   Monitoring Agency: Department of City Planning

2. The applicant shall implement all mitigation measures as defined in Sections IV.A, Earth, IV.E, Noise, IV.F, Light and Glare, IV.H, Transportation/Circulation, and IV.L, Hazardous Materials.

   Monitoring Phase: Pre-Construction, Construction, Post-Construction
   Enforcement Agency: Department of Building and Safety
   Monitoring Agency: Department of Building and Safety

3. The land use on-site shall be limited to that delineated in the chart on page 204 of the DEIR (355,000 square feet of retail; 65,000 square feet of theater (4,000 seats); 30,000 square feet of restaurants; 507,000 square feet of office; 2,010,700 square feet of industrial park) and this limitation shall be recorded in a covenant and agreement and Development Agreement, if any.

   Monitoring Phase: Pre-Construction
   Enforcement Agency: Department of City Planning
   Monitoring Agency: Department of City Planning

H. TRANSPORTATION/CIRCULATION

1. Compliance with Ordinance No. 168,700 (Transportation Demand Management and Trip Reduction Measures). This ordinance focuses on incorporating TDM facilities into the design of new buildings to promote alternative modes of transportation (see Appendix F). It should be followed in the design and construction of the project site and buildings.

   Monitoring Phase: Pre-Construction
   Enforcement Agency: Department of Transportation
   Monitoring Agency: Department of Transportation

2. Compliance with SCAQMD Rule 2202. The South Coast Air Quality Management District (SCAQMD) has adopted a rule designed to reduce the air pollution impacts of commute trips. This rule, unlike the rules it replaces, does not mandate trip reduction programs but allows individual employers to select from a variety of options. Most employers have, however, continued to select ridesharing programs as the most cost-effective method of reducing air quality impacts. If site employers implement these trip reduction measures, 15 percent or more of the peak hour traffic generation from the office/industrial park component of the project could be eliminated.

   Monitoring Phase: Occupancy
   Enforcement Agency: South Coast Air Quality Management District
   Monitoring Agency: Department of Transportation

3. Bus Transit Improvements. The applicant should work with the appropriate transit districts (i.e., Gardena Transit, Torrance Transit and MTA) to improve transit service to the site. Further, sidewalks throughout the site should be designed to provide attractive pedestrian routes to and from transit stops.

   Monitoring Phase: Pre-Construction, Occupancy
   Enforcement Agency: Department of Transportation
   Monitoring Agency: Department of Transportation

4. Hawthorne Boulevard and 190th Street -- Restripe 190th Street and restrict parking to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes. Modify the signal to remove the existing eastbound right-turn phase.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

5. Crenshaw Boulevard and 190th Street -- Remove median islands, restripe and restrict parking along 190th Street to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

6. Crenshaw Boulevard and Del Amo Boulevard -- Restripe Del Amo Boulevard and modify the traffic signal to provide two left-turn-only lanes, a through/left optional lane and a right-turn-only lane in the westbound direction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

7. Western Avenue and Artesia Boulevard -- Restripe Western Avenue and restrict parking to convert the existing northbound and southbound right-turn-only lanes to through/right optional lanes.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

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8. Western Avenue and San Diego Freeway Northbound On/Off- Ramps -- Widen and restripe the off-ramp from two lanes to three lanes to provide two left-turn lanes and a right-turn lane satisfactory to LADOT, Caltrans and the City of Torrance.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

9. San Diego Freeway Southbound On/Off-Ramps and 190th Street -- Flare the west leg of the intersection, restripe 190th Street, restrict parking and modify the signal to provide dual left-turn lanes in the eastbound direction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

10. Western Avenue and 190th Street -- Any mitigation would require a reduction below 11 foot interior lane widths on a high speed state facility and/or acquisition of right-of-way. Therefore, no feasible mitigation is available.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

11. Western Avenue and 195th Street -- The applicant shall fund the installation of the Automated Traffic Surveillance and Control (ATSAC) System at this location satisfactory to LADOT.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

12. <u>Western Avenue and Del Amo Boulevard</u> -- Restripe the eastbound approach for dual left-turn lanes and modify the signal to provide east-west opposed phasing, satisfactory to LADOT, Caltrans and the City of Torrance. The proposed mitigation should also include removal of the north crosswalk. The applicant shall also fund ATSAC installation at this location. This mitigation shall be implemented satisfactory to LADOT.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

13. <u>Western Avenue and Torrance Boulevard</u> -- Any mitigation would require removal of parking, narrowing of the median containing the railroad tracks or acquisition of additional right-of-way, none of which is considered feasible. Therefore, no feasible mitigation is available.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

14. <u>Western Avenue and Carson Street</u> -- Mitigation of this impact would require removal of parking on Carson Street, for which there is a heavy demand. Therefore, no feasible mitigation is available.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

15. <u>Western Avenue and Sepulveda Boulevard</u> -- Prohibit parking to add northbound and southbound right-turn lanes satisfactory to LADOT, Caltrans and the City of Torrance. The mitigation shall not include modification of the median islands on Western Avenue. The northbound right-turn lane can be installed utilizing existing red curb along the frontage of a mini-shopping center.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

16. Western Avenue and Pacific Coast Highway -- Installation of mitigation would require interior lane width of less than 11 feet on a high speed state facility or an offsetting of lanes across the intersection. Therefore, no feasible mitigation is available.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

17. Project Roadway and 190th Street -- Remove the existing traffic signal on 190th Street and the McDonnell Douglas driveway approximately 1,300 feet west of Normandie Avenue and construct a new driveway and traffic signal at this location to serve the major north-south internal road, satisfactory to LADOT. Mitigation shall also include restriping 190th Street for three through lanes in both directions and a left-turn lane in the westbound direction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

18. Normandie Avenue and Artesia Boulevard -- Provide dual left-turn lanes in the southbound direction by restriping Normandie Avenue and modifying the signal.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

19. Normandie Avenue and San Diego Freeway Northbound On/Off-Ramps -- Widen and restripe the northbound approach to provide two through lanes and an exclusive right-turn-only lane to facilitate freeway access. Fund ATSAC installation at this location.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

20. San Diego Freeway Southbound Off-Ramp/Project Driveway and 190th Street -- Flare and restripe 190th Street to provide three travel lanes and dual left-turn lanes in the westbound direction and three travel lanes and a "pre-left-turn lane" for Normandie Avenue in the eastbound direction. Construct the project driveway to provide dual left-turn lanes and a right-turn-only lane in the northbound direction. Install a signal with opposed northbound and southbound phasing. Fund ATSAC installation at this location. If a review of operations shows interference with operation of the signal at 190th Street and Normandie Avenue, LADOT shall restrict turn movements into and/or out of the project driveway.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

21. Normandie Avenue and 190th Street -- Relocate the railroad gates and remove the raised median island from the west leg of 190th Street, subject to approval by the California Public Utilities Commission (PUC). Without PUC approval there is insufficient roadway width to restripe 190th Street for dual left-turn lanes and three through lanes in both directions. Modify the signal to provide east-west left-turn signal phasing with a southbound right-turn overlap phase and fund the installation of ATSAC at this location. Install east-west left-turn signal phasing contingent on PUC approval to relocate the railroad gates so that 190th Street can be restriped for dual left-turn lanes and three through lanes in each direction. Install a southbound right-turn overlap signal and provide ATSAC funding at this location. This intersection is also under the jurisdiction of the Los Angeles County Department of Public Works.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

22. Normandie Avenue and Project Roadway/Francisco Street -- Construct the project roadway and restripe the eastbound approach for a left-turn lane, a through/left lane and a right-turn lane and modify the signal to provide opposed east-west phasing satisfactory to LADOT and the Los Angeles County Department of Public Works.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

23. Normandie Avenue and Torrance Boulevard -- Fund the installation of ATSAC at this intersection satisfactory to LADOT. The South Bay Phase II ATSAC system is proposed for this location.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

24. Normandie Avenue and Carson Street -- Fund the installation of ATSAC at this intersection satisfactory to LADOT. The South Bay Phase II ATSAC system is proposed for this location.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

25. Vermont Avenue and Artesia Boulevard -- Widen and restripe the northbound approach to Vermont Avenue for dual left-turn lanes. The additional left-turn lane can be installed within the existing 80 foot roadway width without any additional widening on Vermont Avenue. Provide a northbound right-turn phase overlapping the existing westbound left-turn phase Install a northbound right-turn lane. This mitigation measure shall be implemented satisfactory to LADOT, Caltrans and the City of Gardena.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

26. Vermont Avenue and 190th Street -- Restripe 190th Street to provide three lanes in each direction and fund the installation of ATSAC at this intersection, satisfactory to LADOT.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

BOE-C6-0075567

27. Vermont Avenue and Torrance Boulevard -- Restrict parking and restripe Vermont Avenue to provide a right-turn-only lane in the northbound and southbound directions, satisfactory to the Los Angeles County Department of Public Works.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

28. Vermont Avenue and Carson Street -- Restrict parking and restripe Vermont Avenue to convert the existing eastbound right-turn-only lane into a through/right optional lane, satisfactory to the Los Angeles County Department of Public Works.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

29. Harbor Freeway Southbound Off-Ramp and 190th Street -- Restripe 190th Street to provide three travel lanes in the westbound direction, satisfactory to LADOT. Modify the signal to provide a southbound right-turn phase extension concurrent with the initiation of the eastbound through phase, satisfactory to LADOT and Caltrans. Fund the installation of ATSAC at this intersection.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

30. Harbor Freeway Northbound On-Ramp and 190th Street -- Install a traffic signal at this location. Modify the median island, prohibit parking on the south side of 190th Street and restripe 190th Street to provide dual eastbound left-turn lanes, including an HOV lane in the inside left-turn lane and two through lanes, satisfactory to LADOT and Caltrans. The on-ramp shall be striped for two lanes and the inside lane on the on-ramp shall be designated as an HOV lane.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

31. Figueroa Street and 190th Street -- Prohibit parking and add a right-turn lane on the southbound approach of Figueroa Street, satisfactory to LADOT and the City of Carson.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

32. Hamilton Avenue and Torrance Boulevard -- Restripe Hamilton Avenue to provide a left/right optional lane and a right-turn-only lane.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

33. Figueroa Street and Torrance Boulevard -- Remove the sidewalk along the south curb, restrict parking and restripe Torrance Boulevard to provide a left-turn-only lane, a through/left optional lane, and through/right optional lane in the eastbound direction. Modify the signal to provide opposed east-west phasing.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

34. Harbor Freeway Southbound On-Off Ramps and Carson Street -- Restripe Carson Street to provide a right-turn-only lane in the eastbound direction.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

35. Crossing gates and signals will be installed or upgraded, as appropriate, at the two proposed new retail center driveways off of Normandie Avenue that cross the Southern Pacific Railroad tracks in accordance with State of California Public Utilities Commission standards.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	California Public Utilities Commission
Monitoring Agency:	Department of Transportation

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36. The design of all internal roadways on the project site, off-site roadway improvements, sidewalks and associated improvements will be subject to the approval of the City of Los Angeles Bureau of Engineering.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Bureau of Engineering
Monitoring Agency:	Department of Transportation

37. A detailed site plan for the retail center shall be submitted to LADOT for approval, indicating the number of parking spaces to be provided and shared.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Transportation
Monitoring Agency:	Department of Transportation

I. PUBLIC SERVICES

I.1 Fire Protection

1. On-site development at the Harbor Gateway Center shall comply with all applicable State and local codes and ordinances, and guidelines found in the Fire Protection and Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of Los Angeles.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

2. Definitive plans and specifications shall be submitted to the Los Angeles Fire Department and requirements for necessary permits shall be satisfied prior to commencement of any portion of the proposed project.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

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3. In order to mitigate the inadequacy of fire protection in travel distance, sprinkler systems shall be required throughout any structure to be built, in accordance with the Los Angeles Municipal Code, Section 57.09.07.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

4. The applicant shall submit plans that show the access road and the turning area for Fire Department approval.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

5. On-site development shall conform to the standard street dimensions shown on Department of Public Works Standard Plan D-22549.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

6. Standard cut-corners will be used on all turns.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

7. During demolition, the Fire Department access will remain clear and unobstructed.

Monitoring Phase:	Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

8. The width of private roadways for general access use and fire lanes shall not be less than 20 feet clear to the sky.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

9. Fire lane width shall not be less than 20 feet. When a fire lane must accommodate the operation of Fire Department aerial ladder apparatus or where fire hydrants are installed, those portions shall not be less than 28 feet in width.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

10. Where access for a given development requires accommodation of Fire Department apparatus, minimum outside radius of the paved surface shall be 35 feet. An additional six feet of clear space must be maintained beyond the outside radius to a vertical point 13 feet 6 inches above the paved surface of the roadway.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

11. No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

12. Adequate off-site public and on-site private fire hydrants may be required. Their number and location are to be determined after the Fire Department's review of the plot plan.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

13. The on-site water delivery system shall be improved to the satisfaction of the Fire Department prior to occupancy.

Monitoring Phase:	Pre-Occupancy
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

14. All first-story portions of any commercial building shall be within 300 feet of an approved fire hydrant.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

15. Fire lanes and dead-ending streets shall terminate in a cul-de-sac or other approved turning area. No dead-ending street or fire lane shall be greater than 700 feet in length without a secondary access being provided.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

16. All access roads, including fire lanes, shall be maintained in an unobstructed manner. The entrance to all required fire lanes or required private driveways shall be posted with a sign no less than three square feet in area in accordance with Section 57.09.05 of the Los Angeles Municipal Code.

Monitoring Phase:	Occupancy
Enforcement Agency:	City Fire Department
Monitoring Agency:	City Fire Department

BOE-C6-0075573

I.2 Police Protection

1. Plot plans for all proposed commercial, office, and industrial development shall be submitted to the Los Angeles Police Department's Crime Prevention section for review and comment. Security features subsequently recommended by the LAPD, possibly including the provision of on-site security, shall be implemented to the extent feasible.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

2. Building plans shall be filed with the LAPD Harbor Area Commanding Officer. Plans shall include access routes, building numbers, and any additional information that might facilitate prompt and efficient police response. Project developers within the project subdivision shall also consult with the LAPD with respect to other on-site security measures which will minimize demand for LAPD services.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

3. Parking areas, entryways, lobbies, and elevators shall be well illuminated and designed with minimum dead space to eliminate areas of concealment.

Monitoring Phase:	Pre-Construction, Occupancy
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

4. Alarms and/or locked gates shall be installed on doorways providing public access.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

5. Landscaping shall not be planted in a way that could provide cover for persons tampering with doors or windows.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

6. Additional lighting shall be installed where appropriate.

Monitoring Phase:	Construction
Enforcement Agency:	Los Angeles Police Department
Monitoring Agency:	Los Angeles Police Department

J. ENERGY CONSERVATION

J.1 Electric Power

1. The proposed project shall adhere to all applicable Los Angeles Department of Water and Power (DWP) rules and regulations. All necessary infrastructure improvements shall be constructed to meet the requirements of the DWP.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Water and Power
Monitoring Agency:	California Public Utilities Commission

2. Should Southern California Edison supply the site at buildout, the proposed project shall adhere to all applicable SCE rules and regulations. SCE shall take the necessary measures to ensure CPUC approval and CEQA compliance, for construction of any new facilities over 50 kV. It is the intent of this EIR to provide compliance with the public notice provision of CPUC General Order 131D for these facilities.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

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3. The proposed project shall comply with and implement all energy conservation measures required by Title 24 of the California Administrative Code, and, whenever feasible, exceed them.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

Mitigation Measures 4 through 20 comprise a list of possible options for achieving minimum efficiency standards required by Mitigation Measure 3 immediately preceding. Not all options listed below would be applicable to every future project within the proposed subdivision. Actual measures utilized will be dependent upon the characteristics of the individual development.

4. Built-in appliances, refrigerators, and space-conditioning equipment should exceed the minimum efficiency levels mandated in the California Code of Regulations.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. Install high-efficiency air conditioning controlled by a computerized energy-management system in the office and retail spaces which provides the following:
   - A variable air-volume system which results in minimum energy consumption and avoid hot water energy consumption for terminal reheat;
   - A 100 percent outdoor air-economizer cycle to obtain free cooling in appropriate climate zones during dry climatic periods;
   - Sequentially staged operation of air-conditioning equipment in accordance with building demands; and
   - The isolation of air-conditioning to any selected floor or floors.
   - Consider the applicability of the use of thermal energy storage to handle cooling loads.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

6. Cascade ventilation air from high-priority areas before being exhausted, thereby, decreasing the volume of ventilation air required. For example, air could be cascaded from occupied space to corridors and then to mechanical spaces before being exhausted.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. Recycle lighting-system heat for space heating during cool weather. Exhaust lighting-system heat from the buildings, via ceiling plenums, to reduce cooling loads in warm weather.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. Install low and medium static-pressure terminal units and ductwork to reduce energy consumption by air-distribution systems.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. Ensure that buildings are well-sealed to prevent outside air from infiltrating and increasing interior space-conditioning loads. Where applicable, design building entrances with vestibules to restrict infiltration of unconditioned air and exhausting of conditioned air.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

10. A performance check of the installed space-conditioning system should be completed by the developer/installer prior to issuance of the certificate of occupancy to ensure that energy-efficiency measures incorporated into the project operate as designed.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

11. Finish exterior walls with light-colored materials and high-emissivity characteristics to reduce cooling loads. Finish interior walls with light-colored materials to reflect more light and, thus, increase lighting efficiency.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

12. Install thermal insulation in walls and ceilings which exceeds requirements established by the California Code of Regulations.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

13. Design window systems to reduce thermal gain and loss, thus, reducing cooling loads during warm weather and heating loads during cool weather.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

14. Install heat-reflective draperies on appropriate exposures.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

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15. Install fluorescent and high-intensity-discharge (HID) lamps, which give the highest light output per watt of electricity consumed, wherever possible including all street and parking lot lighting to reduce electricity consumption.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

16. Install occupant-controlled light switches and thermostats to permit individual adjustment of lighting, heating, and cooling to avoid unnecessary energy consumption.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

17. Install time-controlled interior and exterior public area lighting limited to that necessary for safety and security.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

18. Control mechanical systems (HVAC and lighting) in the building with timing systems to prevent accidental or inappropriate conditioning or lighting of unoccupied space.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

19. Incorporate windowless walls or passive solar inset of windows into the project for appropriate exposures.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

20. Design project to focus pedestrian activity within sheltered outdoor areas.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

J.2 Natural Gas

1. The proposed project shall adhere to all applicable Southern California Gas Company (SCGC) rules and regulations. All necessary infrastructure improvements shall be constructed to meet the requirements of the SCGC.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Southern California Gas Company
Monitoring Agency:	Southern California Gas Company

2. The proposed project shall comply with and implement all energy conservation measures required by Title 24 of the California Administrative Code, and, whenever feasible, exceed them.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

K. UTILITIES

K.1 Communications

1. The proposed project shall adhere to all applicable rules and regulations of the telecommunications service provider and the serving cable television company. All necessary infrastructure improvements shall be constructed to meet the requirements of Pacific Bell and the serving cable television company.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Pacific Bell
Monitoring Agency:	Pacific Bell

K.2 Water

1. The proposed project users and occupants shall adhere to all applicable Los Angeles Department of Water and Power (DWP) and Dominguez Water Company rules and regulations. All necessary infrastructure improvements shall be constructed to meet the requirements of the DWP and the Dominguez Water Company.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	DWP, Dominguez Water Company
Monitoring Agency:	DWP, Dominguez Water Company

2. Proposed projects shall comply with all applicable sections of the City of Los Angeles Water Conservation Ordinance (Ordinance No. 166,080). Specifically, no hose washing of roadways, paved parking areas, and walkways shall be allowed.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. The proposed project shall comply with the City's Water Conservation Regulations defined in Ordinance No. 165,004, including installation of low-flow toilets and plumbing fixtures that prevent water loss. Also, plants selected for landscaping shall comply with xeriscape (low maintenance, drought-resistant) requirements.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

4. Users shall be responsible for obtaining any required Industrial Wastewater Discharge permits required by Sanitation Districts of Los Angeles County (SDLAC).

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Sanitation District of Los Angeles County
Monitoring Agency:	Sanitation District of Los Angeles County

5. The project shall comply with the provisions contained in City Landscape Ordinance No. 170,978, including water conservation measures for landscaping.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of City Planning
Monitoring Agency:	Department of City Planning

The following specific measures are recommended by LADWP to minimize on-site water consumption.

6. Automatic sprinklers should be set to irrigate landscaping during early morning hours or during the evening to reduce water losses from evaporation. However, care must be taken to reset sprinklers to water less often in cooler months and during the rainfall season so that water is not wasted by excessive landscape irrigation.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

7. Reclaimed water should be investigated as a source to irrigate large landscaped areas.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

8. Selection of drought-tolerant, low water consuming plant varieties should be used to reduce irrigation water consumption. For a list of these plant varieties, refer to Sunset Magazine, October 1976, "Good Looking - Unthirsty," pp. 78-85, or consult a landscape architect.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

9. Recirculating hot water systems can reduce water waste in long piping systems where water must be run for considerable periods before hot water is received at the outlet.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

10. Lower-volume water closets and water-saving shower heads must be installed in new construction and when remodeling.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

11. Plumbing fixtures should be selected which reduce potential water loss from leakage due to excessive wear of washers.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

K.3 Sewer

1. Individual projects proposed as part of the Harbor Gateway Center shall apply for all required Sanitation Districts of Los Angeles County (SDLAC) permits, including Industrial Wastewater Discharge Permits.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Sanitation Districts of Los Angeles County
Monitoring Agency:	Sanitation Districts of Los Angeles County

2. All necessary infrastructure improvements shall be constructed to meet the requirements of the SDLAC.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Sanitation Districts of Los Angeles County
Monitoring Agency:	Sanitation Districts of Los Angeles County

3. The proposed project shall comply with all provisions of Ordinance No. 162,532, which reduces water consumption levels, thereby restricting wastewater flows. Water saving devices to be installed shall include low-flow toilets and plumbing fixtures that prevent water loss.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Bureau of Engineering
Monitoring Agency:	Bureau of Engineering

K.4 Solid Waste

1. Trash compaction facilities shall be provided in all occupied structures, where deemed necessary and feasible.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

2. To the extent feasible, one or more of the following yard waste management techniques shall be incorporated into the maintenance of the project:

- Planting drought tolerant plants so as to minimize yard waste.
- Mulching and grass recycling.
- Composting of regular landscape maintenance waste where appropriate.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. Prior to approval of demolition permits, the project sponsor shall be required to demonstrate how demolition debris will be salvaged and recycled in a manner that is practical, available, and assessable during the demolition phase. The project sponsor shall develop explicit language that clearly sets the requirements for a demolition debris recycling plan. The Integrated Solid Waste Management Office (ISWMO) will provide model specification language for project sponsor's use, which includes a format for developing a Solid Waste and Resources Action Plan.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Integrated Solid Waste Management Office
Monitoring Agency:	Department of Building and Safety, Integrated Solid Waste Management Office

4. Prior to approval of building permits, the project sponsor shall be required to demonstrate how construction debris will be recycled in a manner that is practical, available, and accessible during the construction phase. The project sponsor shall develop explicit language in the contractor proposal that clearly spells out the requirements for implementing a construction debris recycling plan. ISWMO shall provide model specification language for project sponsor's use, which includes a format for developing a Solid Waste and Resources Action Plan.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Integrated Solid Waste Management Office
Monitoring Agency:	Department of Building and Safety, Integrated Solid Waste Management Office

5. Prior to approval of building permits, the project sponsor shall submit to the ISWMO a statement detailing the use of recycled materials in building materials, furnishing, operations, and maintenance of the project complex including grounds. The project developer shall maximize the employment of recycled content materials though construction and landscaping application that meet all approved local codes. ISWMO shall provide a summary format for the materials usage statement.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Integrated Solid Waste Management Office
Monitoring Agency:	Department of Building and Safety, Integrated Solid Waste Management Office

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L. RISK OF UPSET

1. Prior to issuance of grading permits, the applicant shall assess, as appropriate, the areas of continued environmental interest identified in the Subsurface Investigation prepared by Kennedy/Jenks Consultants for the area proposed for retail, restaurant, and theater uses (Parcel A in Appendix H of EIR No. 96-0060), and shall implement to the satisfaction of the appropriate regulatory agency any remediation plan that may be required as a result of the data generated by such assessment.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Regional Water Quality Control Board
Monitoring Agency:	Regional Water Quality Control Board

2. A Phase II subsurface investigation shall be conducted for the area proposed for office and industrial park uses (those portions of Parcels B and C in Appendix H of EIR No. 96-0060, for which areas of environmental interest were identified in the June 1996 Phase I Environmental Assessment). The applicant shall fully implement any recommendations for further assessment and/or remediation activity contained in the Phase II investigation, to the satisfaction of the appropriate regulatory agency.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Regional Water Quality Control Board
Monitoring Agency:	Regional Water Quality Control Board

3. No building permits shall be issued for construction of new structures on any portion of the project site in which soil contamination exceeding regulatory action levels exists until contamination on that portion of the project site affected by such activity is remediated to the satisfaction of the appropriate regulatory agency.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Regional Water Quality Control Board

4. Remediation of groundwater contamination having its source in the vicinity of Building 36 shall be undertaken by the applicant separately from the proposed project in coordination with the appropriate regulatory agency. However, on-site development shall be designed and sited so as not to interfere with future groundwater treatment.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

5. All underground storage tanks on the project site shall be removed in conformance with State and City of Los Angeles Fire Department regulations.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety, City Fire Department
Monitoring Agency:	Department of Building and Safety

6. All contractors involved in demolition and/or renovation activity on the project site will fully comply with the requirements of SCAQMD Rule 1403, pertaining to the removal of ACMs.

Monitoring Phase:	Pre-Construction, Construction
Enforcement Agency:	South Coast Air Quality Management District
Monitoring Agency:	Department of Building and Safety

M. AESTHETICS

1. Building height shall not exceed 45 feet within 300 feet of the residential properties south of the project site.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

2. A minimum 8-foot wall shall be constructed along the southern property line between the project site and adjacent residential properties on the north side of 203rd Street. Graffiti resistant paint shall be used on both sides of the wall.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

3. Buildings shall be set back a minimum of 25 feet from the southern property line adjoining residential properties along 203rd Street.

Monitoring Phase:	Pre-Construction
Enforcement Agency:	Department of Building and Safety
Monitoring Agency:	Department of Building and Safety

BOE-C6-0075588

Appendix B
Notice of Preparation/
Comments and Responses

SUMMARY OF NOP RESPONSE LETTERS

Draft Environmental Impact Report

Harbor Gateway Center

SUMMARY OF NOP RESPONSES

No.	Respondent	II. PROJECT DESCRIPTION	III. ENVIRONMENTAL SETTING	IV. ENVIRONMENTAL IMPACT ANALYSIS	A. Earth	B. Air Quality	C. Surface Water	D. Biotic Resources	E. Noise	F. Light and Glare	G. Land Use	H. Transportation/Circulation	I. Public Services	1. Fire Protection	2. Police Protection	J. Energy Conservation	1. Electricity	2. Natural Gas	K. Utilities	1. Communications	2. Water	3. Sewer	4. Solid Waste	L. Hazardous Materials	M. Aesthetics	NOTES
1	Elizabeth J. Harris California Environmental Quality Act Officer Los Angeles Unified School District 355 S. Grand Ave. #500 Los Angeles, CA 90071					●			●																	Secondary impacts of student generation; impacts to student pedestrian routes
2	Stephen J. Buswell IGR/CEQA Coordinator Transportation Planning Office Department of Transportation District 7, 120 S. Spring St. Los Angeles, CA 90012-3606													●												
3	Glenn Hirano Assistant Division Engineer Development Services Division Bureau of Engineering City of Los Angeles				●	●	●			●		●									●	●			●	
4	Michael A. Reavis Manager of Environmental Engineering and Assessment Department of Water and Power City of Los Angeles 111 North Hope Street Los Angeles, CA 90051-0100																●				●					
5	William R. Bamattre Chief Engineer and General Manager Thomas E. McMaster Assistant Fire Marshal City of Los Angeles Fire Department													●												
6	James T. McBride, Commander Commanding Officer Community Affairs Group Los Angeles Police Department P.O. Box 30158 Los Angeles, CA 90030														●											
7	Jack Sedwick Principal City Planner Los Angeles City Planning Department 221 S. Figueroa #310 Los Angeles, CA 90012										●														●	

Draft Environmental Impact Report

Harbor Gateway Center

SUMMARY OF NOP RESPONSES

No.	Respondent	II. PROJECT DESCRIPTION	III. ENVIRONMENTAL SETTING	IV. ENVIRONMENTAL IMPACT ANALYSIS	A. Earth	B. Air Quality	C. Surface Water	D. Biotic Resources	E. Noise	F. Light and Glare	G. Land Use	H. Transportation/Circulation	I. Public Services	1. Fire Protection	2. Police Protection	J. Energy Conservation	1. Electricity	2. Natural Gas	K. Utilities	1. Communications	2. Water	3. Sewer	4. Solid Waste	L. Hazardous Materials	M. Aesthetics	NOTES
8	Kenneth W. Landau, City Manager City of Gardena 1700 West 162nd Street Gardena, CA 90247-3778					●						●		●	●											
9	Patrick Brown Community Development Director City of Carson 701 East Carson Street P.O. Box 6234 Carson, CA 90749											●														
10	William A. Snowden Vice President Corporate Financial Operations Lockheed Martin 6801 Rockledge Drive Bethesda, MD 20817																							●		
11	Rika Jain Environmental and Process Engineer Aircraft Group Moog Inc. Torrance Operations 20263 Western Avenue Torrance, CA 90501																							●		
12	Stuart B. Scudder 712 Elvira Ave. Redondo Beach, CA 90277																								●	Questions about location of rail lines and train traffic
13	Fred & Katherine Henn 1064 W. Del Amo Blvd. Torrance, CA 90501																									General concern about effects on 203rd Street properties

BOE-C6-0075592

NOP RESPONSE LETTERS

Date stamped: June 24, 1996

Elizabeth J. Harris, California Environmental Quality Act Officer
Los Angeles Unified School District
355 S. Grand Ave. #500
Los Angeles, CA 90071

Thank you for providing us the opportunity to comment on the scope and content of the draft environmental impact report (DEIR) for the above-referenced project. District staff if (sic) concerned about the following categories of impacts: secondary impacts of student generation; traffic impacts at schools and on pedestrian routes to school; traffic-induced noise and air emissions at schools.

Secondary Impacts of Student Generation:
The DEIR should estimate the secondary, or indirect impacts that the project will have on schools, in that the project may generate additional housing in the area, which in turn will generate additional students. The attached excerpted pages from the Los Angeles Unified School District School Facilities Fee Plan, Recht Hausrath & Associates, February 1994, will provide the formula needed to estimate this impact. The DEIR analysis on school impacts will need to include data on the enrollments and capacities of schools in the area. Please contact this office for that data.

Traffic-induced Noise and Air Emissions at Schools:
The District requests that the DEIR identify and quantify specific impacts of traffic-generated noise and air emissions near schools. The Districts assessment guidelines for noise, fugitive dust (PM10), and carbon monoxide are attached for your use. These are important to follow because some of the standard guidelines are in many ways inappropriate for measuring impacts on children and other sensitive receptor populations. We will therefore need to evaluate the project's impacts based on the District's assessment guidelines.

Measurements for air quality and noise should be taken at schools, as explained in the attached guidelines. If traffic-generated noise or emissions expose sensitive receptors to substantial levels of noise or pollutants, these are impacts which should be mitigated.

Traffic Impacts at Schools and on Pedestrian Routes to School:
DEIR should also assess the impacts that project-generated traffic will have on schools in the area. The attached list entitled "School Traffic and Student Safety Issues" identifies areas of

concern which should be reviewed to determine impacts. It also suggests mitigation measures to reduce to insignificance any impacts which are identified.

Thank you very much.

Selected pages from the Los Angeles Unified School District (LAUSD) School Facilities Plan, Noise Study Guidelines for fugitive dust and carbon monoxide, and a list of school traffic and student safety issues were included as attachments to the LAUSD response.

Date stamped: June 24, 1996

Stephen J. Buswell, IGR/CEQA Coordinator
Transportation Planning Office
Department of Transportation
District 7, 120 S. Spring St.
Los Angeles, CA 90012-3606

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. The proposed project is a retail "power center" and office/industrial park on a 170-acre site currently occupied by approximately 2.4 million square-feet of industrial warehouse buildings. The first phase consists of 450,000 square feet of retail development. The second and third phases include an estimated 1.3 million and 1.2 million square feet respectively of office/industrial park space.

The information received indicates this project will have a significant traffic impact on the state facilities. You have advised Cheryl Powell of my staff that a Traffic Study has been prepared for this project. To assist us in completely evaluating the impacts of this project on the State Transportation System and to expedite the process we are requesting the Traffic Study be forwarded to Caltrans for review as soon as possible.

We also look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Stephen J. Buswell
District 07 IGR-CEQA Coordinator
Transportation Planning Office
120 S. Spring St.
Los Angeles, CA 90012

A Caltrans Encroachment Permit will be prepared for transportation related mitigation measures or work such as signalization, grading, widening, drainage, or freeway mainline improvements etc., which involve State right-of-way. A Caltrans Project Study Report (PSR) will be prepared for measures that exceed $1,000,000, not including right-of-way.

Please be reminded that transport of heavy construction equipment which requires the use of oversize transport vehicles on State Highways will require a Caltrans transportation permit. We recommend that large size trucks trips be limited to off-peak commute periods.

Thank you for this opportunity to comment. If you have any questions, regarding these comments, please call me at (213) 897-4429.

Date stamped: June 19, 1996

Glenn Hirano, Assistant Division Engineer
Development Services Division (Land Development)
Bureau of Engineering
CITY OF LOS ANGELES

This office has reviewed the aforementioned document and has the following comment:

STREETS:

A full-width concrete sidewalk should be constructed along the property on Western Avenue (State/Major Highway) satisfactory to the City Engineer, the City of Torrance, and CALTRANS.

Installation of tree wells, tree well covers and planting of street trees in 190th Street should be done satisfactory to the Street Tree Division of the Bureau of Street Maintenance.

Installation of street lights should be done satisfactory to the Bureau of Street Lighting.

Note: Western Avenue is designated as a Major State Highway and is partially located in the City of Torrance. Permits must be obtained from CALTRANS and the City of Torrance for any improvements or constructions done within their jurisdictions. Therefore, additional onsite and offsite street dedications and improvements may be required in connection with this development to mitigate the project impacts.

Other project impacts on freeways, highways, and local arterials together with project mitigation measures within the vicinity of the project site should be discussed in the Draft EIR.

The project site plan indicates that "B" Street is to be extended to the easterly project limit and an emergency fire access is to be extended from the proposed terminus of "C" Street to the easterly project limit also. Are "B" Street and the emergency fire access to be extended to Normandie Avenue easterly of the site? If yes, the Draft EIR should thoroughly address the required offsite street easements over the existing Pacific Electric Railroad Right of Way, together with any impact of these two additional at-grade railroad crossings.

Addition (sic) street dedications and improvements along Normandie Avenue may also be required as the result of the proposed connection to the project.

All grading plans, parking area and driveway plan should be submitted to the Harbor District Office of the Bureau of Engineering for review and approval.

Vehicular access to the project site from Harvard Boulevard and Denker Avenue southerly of the project area should be restricted.

The double reverse-curve alignment of "A" Street between "B" Street and "C" Street should be straightened to eliminate potential traffic hazard.

STORM DRAINS:

Existing and new construction of onsite and offsite storm drain systems and other appurtenances should be discussed in the Draft EIR and be included as project mitigation measures. Hydrology/hydraulic calculations, and drainage plans should be submitted to the Harbor District Office of the Bureau of Engineering for review.

STORMWATER:

Please see the attached document entitled "Stormwater Considerations for CEQA Analyses" for information regarding stormwater permits. A permit is required for construction sites of five (5) or more acres in size. Any potential secondary impact, such as the quality of the drainage runoff, from the storm drain construction should also be discussed.

WASTEWATER:

Sewers are now existing in 190th Street adjacent to the property. The construction of mainline and house connection sewers will be required to provide each individual lot a separate house connection.

The City of Los Angeles wastewater collection and treatment system serves portions of the project area. The DEIR should clearly state which portions of the proposed project would generate wastewater which would contribute to flow within the City's wastewater collection system, or be treated at the City's Terminal Island Treatment Plant. If any sewage from this site will be treated by the County Sanitation District, the Draft EIR should address the current capacity together with project impacts on the County System.

The DEIR should include a comprehensive analysis of the wastewater generation potential of these portions of the proposed project, assuming build-out, and include estimates of the quantity and quality of anticipated future daily wastewater flows.

For these portions of the proposed project, the DEIR should also include verification that the sufficient hydraulic capacity exists, within local and downstream collector sewers, to accommodate the proposed project.

WATER:

The DEIR should discuss water conservation measures to be undertaken by the project sponsors that could reduce wastewater generation. Document authors should be aware that the City has enacted comprehensive water conservation requirements for new development.

AIR QUALITY:

In addition to concerns associated with wastewater, all wastewater management providers within the South Coast Air Basin must meet the 1989 Regional Air Quality Management Plan requirements for conformity. The DEIR for the proposed project should address all project related impacts to air quality and measures which will be undertaken by project sponsors to reduce these effects.

If you have any questions, please contact Mr. Ray Saidi at telephone (213) 485-3091.

A document entitled "Stormwater Considerations for CEQA Analyses" was included as an attachment to the City of Los Angeles Bureau of Engineering response. This document is available for review at the Department of City Planning, Environmental Review Section, 221 North Figueroa Street, 15th Floor, Los Angeles, CA 90012.

Date stamped: June 19, 1996

Michael A. Reavis, Manager of Environmental Engineering and Assessment
Department of Water and Power
CITY OF LOS ANGELES
111 North Hope Street
Los Angeles, CA 90051-0100

The Los Angeles Department of Water and Power (LADWP) welcomes the opportunity to provide comments on your Project as requested in Your NOP dated May 10, 1996.

The proposed Project is located on a 170-acre site. The site is generally bounded by West 190th Street on the north, Normandie Avenue on the east, 204th Street on the south and Western Avenue on the west. The Project consists of three phases that will bring the total retail, office, restaurant and industrial space to approximately three million square feet.

LADWP is looking forward to working with the developer to provide electrical and water service needed for the Project. Electrical and water service are available and will be provided in accordance with the LADWP rules and regulations. Electrical and water facility construction may cause limited temporary impact on the surrounding communities in the form of unavoidable noise, air pollution, and traffic congestion during construction and should be considered in the draft environmental documents. LADWP has reviewed the NOP and provides the following comments:

Electrical Service

LADWP's Energy Services Organization (ESO) maintains electric power lines available to serve the Project. The electrical load requirements of the Project are unclear at this time. Therefore, impacts to LADWP's energy services system are unknown at this time.

As a result of the Project size, the following is known at this time:

- Power transformation will be on the Project site.

- Customer will provide conduit and transformer facilities on the Project.

- Easements in A Street and B Street will be required. (Additional easements may be required when further details of the Project are received.)

The Project would not have a significant adverse effect on the electrical service nor would the Project adversely affect ESO's ability to maintain current levels of electrical service in the surrounding community.

Water Service

The following water mains are in the vicinity of this Project:

8" Water Main in 190th Street

30" Water Main in Normandie Avenue

There are no LADWP water mains in Western Avenue. Should the Project require water service from Western Avenue, either a new main must be installed or water service must be provided by another agency (City of Torrance). At this time, there are no plans to increase the capacity of the existing water supply. Should the Project need additional fire protection or domestic service beyond that which the existing system can provide, an upgrade may also be necessary.

Based on the Project, some of the enclosed commercial energy and water conservation mitigation measures may apply and should be considered for inclusion of the Project.

Thank you for the opportunity to submit these comments on this NOP. Please keep us informed of any changes in the Project, so that we may provide timely assistance. If you have any questions or would like to discuss any water service-related issues, please contact Ms. Heidi Kawahara at (213) 367-1230, and for power service issues, please contact Ms. Sueyen Mao at (213) 367-2838.

IMPACT OF THE PROPOSED PROJECT ON THE WATER SYSTEM AND METHODS OF CONSERVING WATER LOS ANGELES DEPARTMENT OF WATER AND POWER

IMPACT ON THE WATER SYSTEM

If the estimated water requirements for the proposed project can be served by existing water mains in the adjacent street(s), water service will be provided routinely in accordance with the Department's Rules and Regulations. If the estimated water requirements are greater than the available capacity of the existing distribution facilities, special arrangements must be made with the Department to enlarge the supply line(s). Supply main enlargement will cause short-term impacts on the environment due to construction activities.

In terms of the City's overall water supply condition, the water requirement for any project which is consistent with the City's General Plan has been taken into account in the planned growth of the Water System. Together with local groundwater sources, the City operates the Los Angeles-Owens River Aqueduct and is a member of the Metropolitan Water District of Southern California (MWD). These three sources will supply the City's water needs for many years to come.

Statewide drought conditions in the mid-1970s and late 1980s dramatically illustrated the need for water conservation in periods of water shortage. However, water should be conserved in Southern California even in years of normal climate because electrical energy is required to deliver supplemental MWD water supplies to the City and the rest of Southern California. Conserving water will minimize purchases from MWD and contribute to the national need for energy conservation.

WATER CONSERVATION

The Water System will assist residential, commercial, and industrial customers in their efforts to conserve water. Recommendations listed below are examples of steps which would conserve water in both new and old construction:

1. Automatic sprinkler systems should be set to irrigate landscaping during early morning hours or during the evening to reduce water losses from evaporation. However, care must be taken to reset sprinklers to water less often in cooler months and during the rainfall season so that water is not wasted BY excessive landscape irrigation.

2. Reclaimed water should be investigated as a source to irrigate large landscaped areas.

3. Selection of drought-tolerant, low water consuming plant varieties should be used to reduce irrigation water consumption. For a list of these plant varieties, refer to Sunset Magazine, October 1976, "Good Looking - Unthirsty," pp. 78-85, or consult a landscape architect.

4. Recirculating hot water systems can reduce water waste in long piping systems where water must be run for considerable periods before hot water is received at the outlet.

5. Lower-volume water closets and water-saving shower heads must be installed in new construction and when remodeling.

6. Plumbing fixtures should be selected which reduce potential water loss from leakage due to excessive wear of washers.

In addition, the provisions contained in the Water Conservation Ordinance of April 1988 must be adhered to.

More detailed information regarding these and other water conservation measures can be obtained from the Department's Water Conservation Office by calling (213) 367-0944.

Commercial Energy Conservation Mitigation Measures

During the design process, the applicant should consult with the Los Angeles Department of Water and Power, Energy Services Subsection, regarding possible energy conservation measures. The applicant shall incorporate measures which will exceed minimum efficiency standards for Title XXIV of the California Code of Regulations.

- Built-in appliances, refrigerators, and space-conditioning equipment should exceed the minimum efficiency levels mandated in the California Code of Regulations.

- Install high-efficiency air conditioning controlled by a computerized energy-management system in the office and retail spaces which provides the following:

  - A variable air-volume system which results in minimum energy consumption and avoids hot water energy consumption for terminal reheat;

  - A 100-percent outdoor air-economizer cycle to obtain free cooling in appropriate climate zones during dry climatic periods;

  - Sequentially staged operation of air-conditioning equipment in accordance with building demands; and

  - The isolation of air conditioning to any selected floor or floors.

  - Consider the applicability of the use of thermal energy storage to handle cooling loads.

- Cascade ventilation air from high-priority areas before being exhausted, thereby, decreasing the volume of ventilation air required. For example, air could be cascaded from occupied space to corridors and then to mechanical spaces before being exhausted.

- Recycle lighting-system heat for space heating during cool weather. Exhaust lighting-system heat from the buildings, via ceiling plenums, to reduce cooling loads in warm weather.

- Install low and medium static-pressure terminal units and ductwork to reduce energy consumption by air-distribution systems.

- Ensure that buildings are well-sealed to prevent outside air from infiltrating and increasing interior space-conditioning loads. Where applicable, design building entrances with vestibules to restrict infiltration of unconditioned air and exhausting of conditioned air.

- A performance check of the installed space-conditioning system should be completed by the developer/installer prior to issuance of the certificate of occupancy to ensure that energy-efficiency measures incorporated into the project operate as designed.

- Finish exterior walls with light-colored materials and high-emissivity characteristics to reduce cooling loads. Finish interior walls with light-colored materials to reflect more light and, thus, increase lighting efficiency.

- Install thermal insulation in walls and ceilings which exceeds requirements established by the California Code of Regulations.

- Design window systems to reduce thermal gain and loss, thus, reducing cooling loads during warm weather and heating loads during cool weather.

- Install heat-reflective draperies on appropriate exposures.

- Install fluorescent and high-intensity-discharge (HID) lamps, which give the highest light output per watt of electricity consumed, wherever possible including all street and parking lot lighting to reduce electricity consumption.

- Install occupant-controlled light switches and thermostats to permit individual adjustment of lighting, heating, and cooling to avoid unnecessary energy consumption.

- Install time-controlled interior and exterior public area lighting limited to that necessary for safety and security.

- Control mechanical systems (HVAC and lighting) in the building with timing systems to prevent accidental or inappropriate conditioning or lighting of unoccupied space.

- Incorporate windowless walls or passive solar inset of windows into the project for appropriate exposures.

- Design project to focus pedestrian activity within sheltered outdoor areas.

For additional information concerning these conservation measures, please contact Mr. Brian L. Belier, Manager of the New Construction Unit of Energy Services Subsection at (213) 481-5202.

Date stamped: June 13, 1996

William R. Bamattre, Chief Engineer and General Manager
Thomas E. McMaster, Assistant Fire Marshal
CITY OF LOS ANGELES
Fire Department

The proposed project is described as a development of a "power center" and office/industrial park on a 170-acre site. Approximately 2.4 million square feet of industrial warehouse buildings exist on the current site.

The project consists of three phases of development which includes the construction of internal access roads and infrastructure improvements. Phase 1 consists of 450,000 square foot (sf) of retail development and 2,200 parking; hence the retail space may include up to 30,000 sf of restaurant space and a theater complex with up 4,000 seats. The second and third phases include an estimated 1.3 million and 1.2 million sf, respectively, of office/industrial park space.

Harbor Gateway Center is located at 1414 West 190th Street between Western and Normandie Avenues.

The pre-draft comments are furnished in response to your request and for this Department to provide preliminary comments on an Environmental Impact Report which has not been prepared. Therefore, the following standard comments are provided based on the limited information presented in your request:

ENVIRONMENTAL/ADVERSE IMPACT

- Project implementation will increase the need for fire protection and emergency medical services in this area.

- The distribution of fire station location for this project site is inadequate. See information below relative to fire station locations.

- Traffic generated by the project could have a significant impact on the Fire Department's ability to respond in a timely manner, into the development area. All street intersections with a level of service of "E" or "F" decreases the level or service of fire protection and emergency medical services provided by this Department.

- Soil contamination is highly probable, since the site was used for industrial purposes.

- Street and fire lane designs shall not create excessive dead-end conditions.

MITIGATION MEASURES

The following mitigation measures where applicable, will aid in reducing the environmental/ adverse impacts to acceptable levels:

- The proposed project shall comply with all applicable State and local codes and ordinances, and the guidelines found in the Fire Protection and Fire Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of Los Angeles (C.P.C. 19708).

- Definitive plans and specifications shall be submitted to this Department and requirements for necessary permits satisfied prior to commencement of any portion of this project.

- Inadequate fire station distribution may be mitigated by restricting the building(s) area, height and density, type of building construction, building occupancy, and built-in fire protection. At present, there are no immediate plans to build new fire stations, increase Fire Department staffing, or resources in order to adequately serve the proposed project.

- All soil remediation activities shall be reviewed and approved by the Underground Tanks Unit. For additional information, please call (213) 485-7543.

- An effective Transportation Demand Management program shall be implemented prior to completion of the project.

- Fire lanes, where required, and dead ending streets shall terminate in a cul-de-sac or other approved turning area. No dead ending street or fire lane shall be greater than 700 feet in length or secondary access shall be required.

- Prior to any building permits being issued, the applicant shall improve, to the satisfaction of the Fire Department, all common fire lanes and install all private fire hydrants to be required.

- Submit plot plans to the Fire Department for review and approval.

- The adequacy of fire protection for a given area is based on required fire-flow, response distance from existing fire stations, and this Department's judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard.

  Fire-flow requirements vary from 2,000 gallons per minute (G.P.M.) in low density residential areas to 12,000 G.P.M. in high-density commercial or industrial areas. A minimum residual water pressure of 20 pounds per square inch (P.S.I.) is to remain in the water system, with the required gallons per minute flowing. The required fire-flow for this project will most likely be set at 9,000 G.P.M. from six fire hydrants flowing simultaneously.

  Improvements to the water system in this area may be required to provide 9,000 G.P.M. fire-flow. The cost of improving the water system may be charged to the developer. For more detailed information regarding water main improvements, the developer shall contact the Water Services Section of the Department of Water and Power.

  Based on a required fire-flow of 9,000 G.P.M., the first-due Engine Company should be within 1 mile, the first-due Truck Company within 1 1/2 miles.

  The Fire Department has existing fire stations at the following locations for initial response into the area of the proposed development:

  Fire Station No. 79
  Paramedic Engine Company
  18030 S. Vermont Avenue
  Gardena, CA 90247
  Staffing - 4
  Miles - 1.2

  Fire Station No. 85
  Task Force and Engine Company
  Paramedic Rescue Ambulance
  1331 W. 253rd Street
  Harbor City, CA 90710
  Staffing - 12
  Miles - 4.2

Fire Station No. 38
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
124 E. "I" Street
Wilmington, CA 90744
Staffing - 12
Miles - 5.0

Fire Station No. 64
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
EMT Rescue Ambulance
118 W. 108th Street
Los Angeles, CA 90061
Staffing - 14
Miles - 6.4

Fire Station No. 49
Single Engine Company
Boats 3 and 4
Battalion 6 Headquarters
400 Yacht Street, Berth 194
Wilmington, CA 90744
Staffing - 13
Miles - 7.3

The above distances were computed to the intersections of West Knox Street and South Normandie Avenue.

Based on this criteria (response distance from existing fire stations), fire protection would be considered inadequate.

In order to mitigate the inadequacy of fire protection in travel distance, sprinkler systems will be required throughout any structure to be built, in accordance with the Los Angeles Municipal Code, Section 57.09.07.

- Submit plot plans that show the access road and the turning area for Fire Department approval.

- Private development shall conform to the standard street dimensions shown on Department of Public Works Standard Plan D-22549.

- Standard cut-corners will be used on all turns.

- During demolition, the Fire Department access will remain clear and unobstructed.

- The width of private roadways for general access use and fire lanes shall not be less than 20 feet clear to the sky.

- Fire lane width shall not be less than 20 feet. When a fire lane must accommodate the operation of Fire Department aerial ladder apparatus or where fire hydrants are installed, those portions shall not be less than 28 feet in width.

- Where access for a given development requires accommodation of Fire Department apparatus, minimum outside radius of the paved surface shall be 35 feet. An additional six feet of clear space must be maintained beyond the outside radius to a vertical point 13 feet 6 inches above the paved surface of the roadway.

- No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

- Adequate off-site public and on-site private fire hydrants may be required. Their number and location to be determined after the Fire Department's review of the plot plan

CONCLUSION

Comments have been provided on a pre-draft basis only, specific comments will be provided once the Environmental Impacts Report is received.

For additional information, please contact the Hydrant Unit at (213) 485-5964.

Date Stamped: July 9, 1996

James T. McBride, Commander
Commanding Officer
Community Affairs Group
LOS ANGELES POLICE DEPARTMENT
P.O. Box 30158
Los Angeles, CA 90030

The proposed Harbor Gateway Center has been reviewed. The proposed project is located in the Los Angeles Police Department's Harbor Area. I have enclosed Reporting District (RD) information relative to crime, average crime rate per thousand persons, predominate crime, population, response time to emergency calls for service and sworn personnel statistics and information.

A project of this size (phases I, II and III) will have a significant impact on police services, however, personnel and/or facilities increases cannot be estimated at this time.

Upon completion of the project, the developer should be encouraged to provide a diagram of the project to the Commanding Officer, Harbor Area. The diagram should include access routes, building numbers and any information that might facilitate police responses.

The Los Angeles Police Department Crime Prevention Section is available to advise the developer on crime prevention features appropriate to the design of this project.

Any further questions regarding this Environmental Impact Report response should be directed to Sergeant Reid F. Morthel, Officer-In-Charge, Crime Prevention Section, at (213) 485-3134.
Very truly yours,

WILLIE L. WILLIAMS
Chief of Police

JAMES T. McBRIDE
Commanding Officer
Community Affairs Group

HARBOR AREA

The proposed Harbor Gateway Center Project is located in Harbor Area, Reporting District (RD) 504*. The Harbor Area covers 25.7 square miles and is located at 2175 John S. Gibson, San Pedro, California 90731, (310) 548-7601.

The service boundaries of Harbor Area are as follows: 182nd Street, Normandie Avenue and Artesia Boulevard to the north, City of Los Angeles Boundary to the east, Pacific Ocean to the south and the City of Los Angeles boundary and Western Avenue to the west.

The average response time to emergency calls for service in Harbor Area in 1995 was 7.7 minutes. The Citywide average during 1995 was 7.6 minutes. There are approximately 247 sworn officers and 31 civilian support staff deployed over three watches at Harbor Area.

Harbor Area's population is 166,011. The population of RD 504, (formerly RD 501), is 5931.

* Harbor Area boundaries and RD's changed this year (1996). The crime statistics given in this EIR were taken from what was formerly RD 501.

FORMULA FOR POPULATION DETERMINATION

The following formula for determining population of new developments was suggested by Michael Brandman Associates, Inc.

Residential: Single and two bedroom condos, apartments, houses equal (3) persons per unit.

Three and four bedroom houses and condos equal (4) persons per unit.

Office Space: Four persons per 1,000 square feet of space.

Retail Space: Three persons per 1,000 square feet of space.

Hotels: Estimate 1.5 persons per room per day at a 59 percent occupancy rate.

LOS ANGELES POLICE DEPARTMENT
CRIMES BY REPORTING DISTRICT OF OCCURRENCE

TYPE OF CRIME	RD #501 - 1995					HARBOR AREA				
	1ST-QTR	2ND-QTR	3RD-QTR	4TH-QTR	TOTAL	1ST-QTR	2ND-QTR	3RD-QTR	4TH-QTR	TOTAL
Burglary from Business	2	2	3	1	8	104	93	80	88	365
Burglary from Residence	6	10	44	54	114	207	218	240	283	948
Burglary Other	1	4	1	0	6	179	187	146	191	703
Street Robbery	4	9	1	5	19	101	113	153	143	510
Other Robbery	0	1	1	4	6	69	61	89	102	321
Murder	0	0	0	0	0	5	8	8	14	35
Rape	0	0	0	0	0	13	15	20	19	67
Aggravated Assault	16	21	39	21	97	486	420	616	518	2,040
Burglary from Vehicle	15	41	32	31	119	546	553	472	438	2,009
Theft from Vehicle	6	6	7	8	27	144	172	161	160	637
Grand Theft	4	9	4	6	23	139	161	163	174	637
Theft from Person	0	0	0	0	0	7	7	4	6	24
Purse Snatch	0	0	0	1	1	4	6	4	9	23
Other Theft	8	6	3	6	23	288	285	253	234	1,060
Bicycle Theft	0	0	0	0	0	0	0	0	0	0
Vehicle Theft	9	12	7	19	47	556	661	584	634	2,435
Bunco	0	0	0	0	0	2	3	3	1	9
TOTAL	71	121	142	156	490	2,850	2,963	2,996	3,014	11,823

LOS ANGELES POLICE DEPARTMENT
CRIMES BY REPORTING DISTRICT OF OCCURRENCE

TYPE OF CRIME	CITYWIDE		
Burglary from Business	8,906		
Burglary from Residence	23,283		
Burglary Other	9,194		
Street Robbery	19,281		
Other Robbery	9,733		
Murder	827		
Rape	1,636		
Aggravated Assault	39,220		
Burglary from Vehicle	46,178		
Theft from Vehicle	15,822		
Grand Theft	14,607		
Theft from Person	1,414		
Purse Snatch	895		
Other Theft	28,647		
Bicycle Theft	29		
Vehicle Theft	50,224		
Bunco	263		

June 5, 1996 (No date stamp)

Jack Sedwick, Principal City Planner
Los Angeles City Planning Department
221 S. Figueroa #310
Los Angeles, CA 90012

We have reviewed your Notice of Preparation for the draft Environmental Impact Report (DEIR) on the Harbor Gateway Center project. Please be advised that the Harbor Gateway Community Plan, originally adopted by the City Council on February 15, 1979, was updated under the Community Plan Update (CPU) Program. The updated Community Plan was adopted by the City Council on January 21, 1996. The Community Plan's land use designation for the proposed project is Heavy Industry, corresponding to the M3 and P zones.

Footnote No. 5, which was revised as a part of CPU and applicable to the site, states: "Industrial areas not within specific plan study area boundaries or the area bounded by San Diego Freeway to the north, Del Amo Boulevard to the south, Western Avenue to the west, and Harbor Freeway to the east, are intended to be limited to Height District 1VL.["]

We are satisfied with your initial study checklist and its determination to prepare an EIR. We would like to review and comment on the draft EIR when it is ready.

If you have any questions or need additional information regarding our comments, please contact Ras Cannady at (213) 485-6647.

An excerpt from the Harbor Gateway Community Plan that includes Footnote No. 5 (see above) was included as an attachment to the Los Angeles City Planning Department response.

Date stamped: June 4, 1996

William A. Snowden, Vice President
Corporate Financial Operations
LOCKHEED MARTIN
6801 Rockledge Drive
Bethesda MD 20817

I would like to thank you for this opportunity to comment on the scope of the Environmental Impact Report ("EIR") currently proposed for the McDonnell Douglas site. As neighbors immediately west of the McDonnell Douglas property, we are understandably concerned with any potential impacts to our site that could result from development of the site and any remediation. This would include impacts to future occupants of our proposed shopping center which we anticipate will be opened for business by late 1997.

Our site and that of McDonnell Douglas were utilized for years in manufacturing aircraft parts, with certain probably (sic) contamination results. For three years, we have undertaken a detailed evaluation of contamination at our site and are currently remediating the site with the Department of Toxic Substance Control ("DTSC") as the lead agency. We assume, because of many similar uses between our property and the McDonnell Douglas facility, they will face in their investigation and remediation many of the same issues and problems we have faced over the last three years. We note from your initial study, the EIR will address past heavy industrial uses and potential site remediation with DTSC. This is certainly appropriate.

We found in our investigation that the location of contamination played a role in dictating the site plan which we developed. We assume such will be the result in this project's evaluation of contamination and remediation followed by appropriate site planning. As to the scope of review, is the entire 170-acre McDonnell Douglas site part of the environmental review or only the more limited 40-acre parcel on the northern end of the property designated on their preliminary site plan as retail? Can the investigation be piecemealed? Your consideration of our issues presented would be appreciated.

Date stamped: May 13, 1996

Stuart B. Scudder
712 Elvira Ave.
Redondo Beach, CA 90277

I am the owner of property at 1519 Del Amo. I back up to the project on its southern boundaries.

The project, if properly design (sic) should have a positive effect on the area.

My particular concerns relate to the southern boundary of the project. I have several questions:

1. Will the railroad remain at its present location and will the right of way continue to be secure?

2. Will the masonry wall buffering the railroad from residential be raised to eight or ten feet?

3. Will railroad traffic be increased substantially?

Please keep me informed about the design changes in Phase 3, the southern phase of the project.

Date stamped: May 31, 1996

Rika Jain, Environmental and Process Engineer
Aircraft Group
Moog Inc.
Torrance Operations
20263 Western Avenue
Torrance, CA 90501

Moog Inc., kindly submits the following concerns regarding the proposed *Harbor Gateway Center* (vesting tentative tract 52172):

- The project site has been used for several industrial operations with possible soil contamination. Moog Inc. is concerned with the potential exposure of Moog employees to hazardous materials by the dust created during earth moving/grading operations causing this contaminated soil to be air borne.

- If the soil is determined to be contaminated, any remediation activity that may result in increased dust emissions is also a concern of Moog Inc.

- The proposed site will be located in an Industrial area thus imposing increased financial burden on industries when notification for implementing required facility expansion/ changes etc.

- Several industries in the area not only handle hazardous material but also store large quantities of chemicals on their property. The impact of an accidental release of these chemicals during a seismic event or otherwise may involve a larger population than prior to this project.

Moog Inc. has several other concerns but given the time constraints is unable to comment on other areas of concern. Moog Inc. appreciates the opportunity provided to comment on the proposed project.

If you have any questions please do not hesitate to contact Rika Jain at (310) 618-6596.

Thank you.

Date stamped: May 16, 1996

Kenneth W. Landau, City Manager
CITY OF GARDENA
1700 West 162nd Street
Gardena, CA 90247-3778

The City of Gardena appreciates receiving the Notice of Preparation of a Draft Environmental Impact Report for the subject project. As a neighboring city, we are indeed interested and concerned about the intensity of development being proposed for this site, as well as for the Lockheed Martin site (EIR-95-0177-SUB). When developed these two projects, both individually and cumulatively, will have significant adverse impacts on our City as well as other neighboring communities.

Of the impacts identified in the Initial Study, we are particularly concerned about traffic, air quality and public services. Project generated vehicular traffic, ingress/egress locations and demand for incremental parking will exceed the current arterial capacities of local streets and level of service at several key intersections. This level of traffic, which may be beyond mitigation, will also cause severe local air pollution conditions leading to significant deterioration of the ambient air quality. The lack of adequate provision of public safety, fire protection and emergency services for the project area by the City of Los Angeles may place an undue burden on the public safety delivery systems of neighboring cities.

Finally, we believe the EIR must also address the economic impacts these two projects, both individually and cumulatively, will have on our local economies. As the South Bay sub-region has been one of the hardest hit areas of Los Angeles County because of the economic recession, this level of development at this location cannot but have serious consequences on our efforts to re-energize the local economy. At a time when cities in the SCAG region have placed such high priority on regional cooperation, it would behoove the EIR to address this issue of utmost concern to us.

Again, we appreciate this opportunity to provide our initial comments and look forward to being able to review the Draft EIR to determine to what extent our concerns have been adequately addressed. Should you have any questions regarding our concerns or need further clarification, please contact Kathy Ikari, Community Development Director at (310) 217-956 (sic).

Date stamped: June 17 1996

Patrick Brown, Community Development Director
CITY OF CARSON
701 East Carson Street
P.O. Box 6234
Carson, California 90749

The City of Carson appreciates the opportunity to comment on the subject Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Harbor Gateway Project. Staff has reviewed the material provided with the NOP, including the Project Description, Initial Study, and the possible environmental impacts.

The Draft EIR should include an evaluation of the impacts on the entrance ramps to the Harbor (I-110) and San Diego (I-405) Freeways. The Transportation Regional Traffic Analysis should also include an evaluation of the impact of this project on the extension of Del Amo Boulevard which is a major cross county arterial. The City of Carson is expected to begin construction of Del Amo Boulevard over the San Diego Freeway in February, 1997. The completion of this link will extend Del Amo Boulevard from Orange County to the segment south of the property being evaluated in the EIR. Del Amo Boulevard is on the County Master Plan and should be addressed in relation to this project.

Please forward us a copy of the Draft EIR for our review and comment as soon as it is available.

If you have any questions, please feel free to call me or Chris Ketz, Environmental Planner at (310) 952-1761.

Date stamped: May 17, 1996

Fred & Katherine Henn
1064 W. Del Amo Blvd.
Torrance, CA 90501

This property is not owned by McDonnell Douglas Realty Company and they certainly have no rights to 203rd St. What kind of dastardly trick is being pulled here anyhow.

We want any project to stop at McDonnell property (sic).

COMMENTS AND RESPONSES

LOS ANGELES UNIFIED SCHOOL DISTRICT (LETTER 1)

Elizabeth J. Harris, California Environmental Quality Act Officer
Los Angeles Unified School District
355 S. Grand Ave. #500
Los Angeles, CA 90071

Comment 1.A

Thank you for providing us the opportunity to comment on the scope and content of the draft environmental impact report (DEIR) for the above-referenced project. District staff if (sic) concerned about the following categories of impacts: secondary impacts of student generation; traffic impacts at schools and on pedestrian routes to school; traffic-induced noise and air emissions at schools.

Response 1.A

Specific concerns in each of the categories of impacts about which the Los Angeles Unified School District (LAUSD) is concerned are responded to below.

Comment 1.B

The DEIR should estimate the secondary, or indirect impacts that the project will have on schools, in that the project may generate additional housing in the area, which in turn will generate additional students. The attached excerpted pages from the Los Angeles Unified School District School Facilities Fee Plan, Recht Hausrath & Associates, February 1994, will provide the formula needed to estimate this impact. The DEIR analysis on school impacts will need to include data on the enrollments and capacities of schools in the area. Please contact this office for that data.

Response 1.B

As mentioned in Item 14.C of the Initial Study for the proposed project, the Harbor Gateway Center does not propose any residential units. Therefore, project buildout would not create a direct need for additional classroom space at any schools that serve the project area. Although full project buildout and occupancy would create approximately 5,000 new jobs on the project site, this number is comparable to the 5,500 employees that previously worked at the McDonnell Douglas facility at peak employment. In addition, many on-site employees are expected to come from the available local work force in the South Bay Cities subregion. Thus, no significant additional demand for school facilities in the project vicinity or further afield would be expected as a result of project implementation. Therefore, this issue is not further analyzed in the EIR.

Comment 1.C

The District requests that the DEIR identify and quantify specific impacts of traffic-generated noise and air emissions near schools. The Districts assessment guidelines for noise, fugitive dust (PM10), and carbon monoxide are attached for your use. These are important to follow because some of the standard guidelines are in many ways inappropriate for measuring impacts on children and other sensitive receptor populations. We will therefore need to evaluate the project's impacts based on the District's assessment guidelines.

Measurements for air quality and noise should be taken at schools, as explained in the attached guidelines. If traffic-generated noise or emissions expose sensitive receptors to substantial levels of noise or pollutants, these are impacts which should be mitigated.

Response 1.C

The proposed project's air quality and noise impacts, including impacts to sensitive receptors such as schools, are discussed in EIR Sections IV.B and IV.E, respectively.

Comment 1.D

DEIR should also assess the impacts that project-generated traffic will have on schools in the area. The attached list entitled "School Traffic and Student Safety Issues" identifies areas of concern which should be reviewed to determine impacts. It also suggests mitigation measures to reduce to insignificance any impacts which are identified.

Response 1.D

The LAUSD school nearest the project site is the 186th Street School, which is about 1,500 feet away and separated from the project site by the San Diego Freeway. Therefore, project implementation would not be expected to affect any school pedestrian crossings. Because no schools are in the vicinity of the project site, no impacts related to school traffic and student safety issues are anticipated. Consequently, this issue is not further addressed in the EIR.

CALIFORNIA DEPARTMENT OF TRANSPORTATION (LETTER 2)

Stephen J. Buswell, IGR/CEQA Coordinator
Transportation Planning Office
Department of Transportation
District 7, 120 S. Spring St.
Los Angeles, CA 90012-3606

Comment 2.A

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. The proposed project is a retail "power center" and office/industrial park on a 170-acre site currently occupied by approximately 2.4 million square-feet of industrial warehouse buildings. The first phase consists of 450,000 square feet of retail development. The second and third phases include an estimated 1.3 million and 1.2 million square feet respectively of office/industrial park space.

Response 2.A

No response is necessary.

Comment 2.B

The information received indicates this project will have a significant traffic impact on the state facilities. You have advised Cheryl Powell of my staff that a Traffic Study has been prepared for this project. To assist us in completely evaluating the impacts of this project on the State Transportation System and to expedite the process we are requesting the Traffic Study be forwarded to Caltrans for review as soon as possible.

Response 2.B

The project traffic study will be forwarded to the California Department of Transportation following approval of the study by the City of Los Angeles Department of Transportation.

Comment 2.C

We also look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Stephen J. Buswell
District 07 IGR-CEQA Coordinator
Transportation Planning Office
120 S. Spring St.
Los Angeles, CA 90012

Response 2.C

Two copies of the DEIR will be sent directly to Caltrans.

Comment 2.D

A Caltrans Encroachment Permit will be prepared for transportation related mitigation measures or work such as signalization, grading, widening, drainage, or freeway mainline improvements etc., which involve State right-of-way. A Caltrans Project Study Report (PSR) will be prepared for measures that exceed $1,000,000, not including right-of-way.

Response 2.D

A Caltrans Encroachment Permit will be obtained for any mitigation that involves a state right-of-way.

Comment 2.E

Please be reminded that transport of heavy construction equipment which requires the use of oversize transport vehicles on State Highways will require a Caltrans transportation permit. We recommend that large size trucks trips be limited to off-peak commute periods.

Response 2.E

Permits for the transport of heavy construction equipment will be obtained at such time as they are required. To the extent feasible, construction-related truck trips would be limited to off-peak commute periods.

CITY OF LOS ANGELES BUREAU OF ENGINEERING (LETTER 3)

Glenn Hirano, Assistant Division Engineer
Development Services Division (Land Development)
Bureau of Engineering
CITY OF LOS ANGELES

Comment 3.A

A full-width concrete sidewalk should be constructed along the property on Western Avenue (State/Major Highway) satisfactory to the City Engineer, the City of Torrance, and CALTRANS.

Response 3.A

Sidewalks will be constructed along street frontages as required by the ruling jurisdiction(s).

Comment 3.B

Installation of tree wells, tree well covers and planting of street trees in 190th Street should be done satisfactory to the Street Tree Division of the Bureau of Street Maintenance.

Response 3.B

Proposed street plantings are described in Section II.D.2.b of the EIR Project Description. All tree installation will be in accordance with Street Tree Division requirements.

Comment 3.C

Installation of street lights should be done satisfactory to the Bureau of Street Lighting.

Response 3.C

All street lighting will be constructed in accordance with Bureau of Street Lighting requirements.

Comment 3.D

Western Avenue is designated as a Major State Highway and is partially located in the City of Torrance. Permits must be obtained from CALTRANS and the City of Torrance for any improvements or constructions done within their jurisdictions. Therefore, additional onsite and offsite street dedications and improvements may be required in connection with this development to mitigate the project impacts.

Response 3.D

Permits for any improvements or street dedications needed to mitigate project impacts will be obtained at such time as they are required.

Comment 3.E

Other project impacts on freeways, highways, and local arterials together with project mitigation measures within the vicinity of the project site should be discussed in the Draft EIR.

Response 3.E

The proposed project's impacts upon freeways, highways, and local arterials are described in Section IV.H, Transportation/Circulation, of the Draft EIR. Feasible measures to partially or fully mitigate all identified significant impacts are also included in Section IV.H.

Comment 3.F

The project site plan indicates that "B" Street is to be extended to the easterly project limit and an emergency fire access is to be extended from the proposed terminus of "C" Street to the easterly project limit also. Are "B" Street and the emergency fire access to be extended to Normandie Avenue easterly of the site? If yes, the Draft EIR should thoroughly address the required offsite street easements over the existing Pacific Electric Railroad Right of Way, together with any impact of these two additional at-grade railroad crossings.

Response 3.F

Both "B" Street and the "C" Street emergency extension are proposed to extend to Normandie Avenue and would therefore require rail crossings. These new crossings would require an agreement with the Southern Pacific railroad and approval of the California Public Utilities

Commission. Such approval would not be expected to be granted unless the crossings would not adversely affect rail service. Therefore, further analysis of impacts related to rail crossings is not warranted.

Comment 3.G

Addition (sic) street dedications and improvements along Normandie Avenue may also be required as the result of the proposed connection to the project.

Response 3.G

Any street dedications and improvements needed to mitigated the project's impacts on Normandie Avenue are included in EIR Section IV.H, Transportation/Circulation.

Comment 3.H

All grading plans, parking area and driveway plan should be submitted to the Harbor District Office of the Bureau of Engineering for review and approval.

Response 3.H

Grading, parking, and driveway plans will be submitted to the Office of the Bureau of Engineering at such time as these permit applications are filed.

Comment 3.I

Vehicular access to the project site from Harvard Boulevard and Denker Avenue southerly of the project area should be restricted.

Response 3.I

No direct vehicle access is proposed for the southern end of the site. All proposed access points are on 190th Street, Western Avenue, and Normandie Avenue.

Comment 3.J

The double reverse-curve alignment of "A" Street between "B" Street and "C" Street should be straightened to eliminate potential traffic hazard.

Response 3.J

The final alignment for all internal roadways will be subject to the approval of the City of Los Angeles Bureau of Engineering.

Comment 3.K

Existing and new construction of onsite and offsite storm drain systems and other appurtenances should be discussed in the Draft EIR and be included as project mitigation measures. Hydrology/hydraulic calculations, and drainage plans should be submitted to the Harbor District Office of the Bureau of Engineering for review.

Response 3.K

On-site drainage issues are discussed in EIR Section IV.C, Surface Water. The applicant will prepare detailed flood control plans that will include any needed drainage infrastructure. All plans will require City and Los Angeles County Flood Control District approval prior to issuance of building permits.

Comment 3.L

Please see the attached document entitled "Stormwater Considerations for CEQA Analyses" for information regarding stormwater permits. A permit is required for construction sites of five (5) or more acres in size. Any potential secondary impact, such as the quality of the drainage runoff, from the storm drain construction should also be discussed.

Response 3.L

The effects of construction activity on stormwater quality, including a discussion of required stormwater permits, are discussed in EIR Section IV.C, Surface Water.

Comment 3.M

Sewers are now existing in 190th Street adjacent to the property. The construction of mainline and house connection sewers will be required to provide each individual lot a separate house connection.

Response 3.M

Sewer system impacts are evaluated in EIR Section IV.K.3, Sewer. Any needed improvements to sewer infrastructure will be constructed prior to project occupancy.

Comment 3.N

The City of Los Angeles wastewater collection and treatment system serves portions of the project area. The DEIR should clearly state which portions of the proposed project would generate wastewater which would contribute to flow within the City's wastewater collection system, or be treated at the City's Terminal Island Treatment Plant. If any sewage from this site will be treated by the County Sanitation District, the Draft EIR should address the current capacity together with project impacts on the County System.

Response 3.N

Impacts to the City of Los Angeles wastewater collection treatment system are evaluated in EIR Section IV.K.3, Sewer.

Comment 3.O

The DEIR should include a comprehensive analysis of the wastewater generation potential of these portions of the proposed project, assuming build-out, and include estimates of the quantity and quality of anticipated future daily wastewater flows. For these portions of the proposed project, the DEIR should also include verification that the sufficient hydraulic capacity exists, within local and downstream collector sewers, to accommodate the proposed project.

Response 3.O

Impacts to the City of Los Angeles wastewater collection treatment system are evaluated in EIR Section IV.K.3, Sewer.

Comment 3.P

The DEIR should discuss water conservation measures to be undertaken by the project sponsors that could reduce wastewater generation. Document authors should be aware that the City has enacted comprehensive water conservation requirements for new development.

Response 3.P

Water conservation measures recommended by the Los Angeles Department of Water and Power are included in EIR Section IV.K.2, Water.

Comment 3.Q

In addition to concerns associated with wastewater, all wastewater management providers within the South Coast Air Basin must meet the 1989 Regional Air Quality Management Plan requirements for conformity. The DEIR for the proposed project should address all project related impacts to air quality and measures which will be undertaken by project sponsors to reduce these effects.

Response 3.Q

The proposed project's impacts upon local and regional air quality, including a discussion of conformity with the Regional Air Quality Management Plan, are evaluated in EIR Section IV.B, Air Quality.

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER (LETTER 4)

Michael A. Reavis, Manager of Environmental Engineering and Assessment
Department of Water and Power
CITY OF LOS ANGELES
111 North Hope Street
Los Angeles, CA 90051-0100

Comment 4.A

The Los Angeles Department of Water and Power (LADWP) welcomes the opportunity to provide comments on your Project as requested in Your NOP dated May 10, 1996.

The proposed Project is located on a 170-acre site. The site is generally bounded by West 190th Street on the north, Normandie Avenue on the east, 204th Street on the south and Western Avenue on the west. The Project consists of three phases that will bring the total retail, office, restaurant and industrial space to approximately three million square feet.

LADWP is looking forward to working with the developer to provide electrical and water service needed for the Project. Electrical and water service are available and will be provided in accordance with the LADWP rules and regulations. Electrical and water facility construction may cause limited temporary impact on the surrounding communities in the form of unavoidable noise, air pollution, and traffic congestion during construction and should be considered in the draft environmental documents.

Response 4.A

No response is necessary.

Comment 4.B

LADWP's Energy Services Organization (ESO) maintains electric power lines available to serve the Project. The electrical load requirements of the Project are unclear at this time. Therefore, impacts to LADWP's energy services system are unknown at this time.

As a result of the Project size, the following is known at this time:

- Power transformation will be on the Project site.

- Customer will provide conduit and transformer facilities on the Project.

- Easements in A Street and B Street will be required. (Additional easements may be required when further details of the Project are received.)

The Project would not have a significant adverse effect on the electrical service nor would the Project adversely affect ESO's ability to maintain current levels of electrical service in the surrounding community.

Response 4.B

This information regarding the provision of electricity to the project site has been incorporated into EIR Section IV.J.1, Electrical Power.

Comment 4.C

The following water mains are in the vicinity of this Project:

8" Water Main in 190th Street

30" Water Main in Normandie Avenue

There are no LADWP water mains in Western Avenue. Should the Project require water service from Western Avenue, either a new main must be installed or water service must be provided by another agency (City of Torrance). At this time, there are no plans to increase the capacity of the existing water supply. Should the Project need additional fire protection or domestic service beyond that which the existing system can provide, an upgrade may also be necessary.

Based on the Project, some of the enclosed commercial energy and water conservation mitigation measures may apply and should be considered for inclusion of the Project.

Response 4.C

This information regarding water service to the project site has been incorporated into EIR Section IV.K.2, Water.

Comment 4.D

Thank you for the opportunity to submit these comments on this NOP. Please keep us informed of any changes in the Project, so that we may provide timely assistance. If you have any questions or would like to discuss any water service-related issues, please contact Ms. Heidi Kawahara at (213) 367-1230, and for power service issues, please contact Ms. Sueyen Mao at (213) 367-2838.

Response 4.D

No response is necessary.

Comment 4.E

If the estimated water requirements for the proposed project can be served by existing water mains in the adjacent street(s), water service will be provided routinely in accordance with the Department's Rules and Regulations. If the estimated water requirements are greater than the available capacity of the existing distribution facilities, special arrangements must be made with the Department to enlarge the supply line(s). Supply main enlargement will cause short-term impacts on the environment due to construction activities.

In terms of the City's overall water supply condition, the water requirement for any project which is consistent with the City's General Plan has been taken into account in the planned growth of the Water System. Together with local groundwater sources, the City operates the Los Angeles-Owens River Aqueduct and is a member of the Metropolitan Water District of Southern California (MWD). These three sources will supply the City's water needs for many years to come.

Statewide drought conditions in the mid-1970s and late 1980s dramatically illustrated the need for water conservation in periods of water shortage. However, water should be conserved in Southern California even in years of normal climate because electrical energy is required to deliver supplemental MWD water supplies to the City and the rest of Southern California. Conserving water will minimize purchases from MWD and contribute to the national need for energy conservation.

Response 4.E

This information regarding local and regional water supplies has been incorporated into EIR Section IV.K.2, Water.

Comment 4.F

The Water System will assist residential, commercial, and industrial customers in their efforts to conserve water. Recommendations listed below are examples of steps which would conserve water in both new and old construction:

1. Automatic sprinkler systems should be set to irrigate landscaping during early morning hours or during the evening to reduce water losses from evaporation. However, care must be taken to reset sprinklers to water less often in cooler months and during the rainfall season so that water is not wasted BY excessive landscape irrigation.

2. Reclaimed water should be investigated as a source to irrigate large landscaped areas.

3. Selection of drought-tolerant, low water consuming plant varieties should be used to reduce irrigation water consumption. For a list of these plant varieties, refer to Sunset Magazine, October 1976, "Good Looking - Unthirsty," pp. 78-85, or consult a landscape architect.

4. Recirculating hot water systems can reduce water waste in long piping systems where water must be run for considerable periods before hot water is received at the outlet.

5. Lower-volume water closets and water-saving shower heads must be installed in new construction and when remodeling.

6. Plumbing fixtures should be selected which reduce potential water loss from leakage due to excessive wear of washers.

In addition, the provisions contained in the Water Conservation Ordinance of April 1988 must be adhered to.

More detailed information regarding these and other water conservation measures can be obtained from the Department's Water Conservation Office by calling (213) 367-0944.

Response 4.F

All of these recommended mitigation measures have been included in EIR Section IV.J.1, Electrical Power.

Comment 4.G

During the design process, the applicant should consult with the Los Angeles Department of Water and Power, Energy Services Subsection, regarding possible energy conservation measures. The applicant shall incorporate measures which will exceed minimum efficiency standards for Title XXIV of the California Code of Regulations.

- Built-in appliances, refrigerators, and space-conditioning equipment should exceed the minimum efficiency levels mandated in the California Code of Regulations.

- Install high-efficiency air conditioning controlled by a computerized energy-management system in the office and retail spaces which provides the following:

    - A variable air-volume system which results in minimum energy consumption and avoids hot water energy consumption for terminal reheat;

    - A 100-percent outdoor air-economizer cycle to obtain free cooling in appropriate climate zones during dry climatic periods;

    - Sequentially staged operation of air-conditioning equipment in accordance with building demands; and

    - The isolation of air conditioning to any selected floor or floors.

    - Consider the applicability of the use of thermal energy storage to handle cooling loads.

- Cascade ventilation air from high-priority areas before being exhausted, thereby, decreasing the volume of ventilation air required. For example, air could be cascaded from occupied space to corridors and then to mechanical spaces before being exhausted.

- Recycle lighting-system heat for space heating during cool weather. Exhaust lighting-system heat from the buildings, via ceiling plenums, to reduce cooling loads in warm weather.

- Install low and medium static-pressure terminal units and ductwork to reduce energy consumption by air-distribution systems.

- Ensure that buildings are well-sealed to prevent outside air from infiltrating and increasing interior space-conditioning loads. Where applicable, design building entrances with vestibules to restrict infiltration of unconditioned air and exhausting of conditioned air.

- A performance check of the installed space-conditioning system should be completed by the developer/installer prior to issuance of the certificate of occupancy to ensure that energy-efficiency measures incorporated into the project operate as designed.

- Finish exterior walls with light-colored materials and high-emissivity characteristics to reduce cooling loads. Finish interior walls with light-colored materials to reflect more light and, thus, increase lighting efficiency.

- Install thermal insulation in walls and ceilings which exceeds requirements established by the California Code of Regulations.

- Design window systems to reduce thermal gain and loss, thus, reducing cooling loads during warm weather and heating loads during cool weather.

- Install heat-reflective draperies on appropriate exposures.

- Install fluorescent and high-intensity-discharge (HID) lamps, which give the highest light output per watt of electricity consumed, wherever possible including all street and parking lot lighting to reduce electricity consumption.

- Install occupant-controlled light switches and thermostats to permit individual adjustment of lighting, heating, and cooling to avoid unnecessary energy consumption.

- Install time-controlled interior and exterior public area lighting limited to that necessary for safety and security.

- Control mechanical systems (HVAC and lighting) in the building with timing systems to prevent accidental or inappropriate conditioning or lighting of unoccupied space.
- Incorporate windowless walls or passive solar inset of windows into the project for appropriate exposures.
- Design project to focus pedestrian activity within sheltered outdoor areas.

For additional information concerning these conservation measures, please contact Mr. Brian L. Belier, Manager of the New Construction Unit of Energy Services Subsection at (213) 481-5202.

Response 4.G

All of these recommended energy conservation measures have been included in EIR Section IV.J.1, Electrical Power.

CITY OF LOS ANGELES FIRE DEPARTMENT (LETTER 5)

William R. Bamattre, Chief Engineer and General Manager
Thomas E. McMaster, Assistant Fire Marshal
CITY OF LOS ANGELES
Fire Department

Comment 5.A

The proposed project is described as a development of a "power center" and office/industrial park on a 170-acre site. Approximately 2.4 million square feet of industrial warehouse buildings exist on the current site.

The project consists of three phases of development which includes the construction of internal access roads and infrastructure improvements. Phase 1 consists of 450,000 square foot (sf) of retail development and 2,200 parking; hence the retail space may include up to 30,000 sf of restaurant space and a theater complex with up 4,000 seats. The second and third phases include an estimated 1.3 million and 1.2 million sf, respectively, of office/industrial park space.

Harbor Gateway Center is located at 1414 West 190th Street between Western and Normandie Avenues.

The pre-draft comments are furnished in response to your request and for this Department to provide preliminary comments on an Environmental Impact Report which has not been prepared. Therefore, the following standard comments are provided based on the limited information presented in your request:

Response 5.A

No response is necessary.

Comment 5.B

Project implementation will increase the need for fire protection and emergency medical services in this area.

Response 5.B

The potential increase in the need for fire protection and emergency medical service is discussed in EIR Section IV.I.1, Fire Protection.

Comment 5.C

The distribution of fire station location for this project site is inadequate. See information below relative to fire station locations.

Response 5.C

As required by the Fire Department, the inadequacy of fire station locations would be mitigated through the incorporation of sprinkler systems in all on-site structures (see Section IV.I.1, Fire Protection).

Comment 5.D

Traffic generated by the project could have a significant impact on the Fire Department's ability to respond in a timely manner, into the development area. All street intersections with a level of service of "E" or "F" decreases the level or service of fire protection and emergency medical services provided by this Department.

Response 5.D

The project's impact upon traffic levels is discussed in EIR Section IV.H, Transportation/ Circulation. The effect of project traffic on fire protection and emergency medical service is discussed in Section IV.I.1, Fire Protection.

Comment 5.E

Soil contamination is highly probable, since the site was used for industrial purposes.

Response 5.E

Impacts related to on-site soil contamination are discussed in EIR Section IV.L, Risk of Upset.

Comment 5.F

Street and fire lane designs shall not create excessive dead-end conditions.

Response 5.F

The only dead end proposed is at the end of "C" Street, which would include an emergency fire access extension to Normandie Avenue (see Figure 10 of Section II.D, Project Characteristics).

Comment 5.G

The following mitigation measures where applicable, will aid in reducing the environmental/ adverse impacts to acceptable levels:

- The proposed project shall comply with all applicable State and local codes and ordinances, and the guidelines found in the Fire Protection and Fire Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of Los Angeles (C.P.C. 19708).

- Definitive plans and specifications shall be submitted to this Department and requirements for necessary permits satisfied prior to commencement of any portion of this project.

- Inadequate fire station distribution may be mitigated by restricting the building(s) area, height and density, type of building construction, building occupancy, and built-in fire protection. At present, there are no immediate plans to build new fire stations, increase Fire Department staffing, or resources in order to adequately serve the proposed project.

- All soil remediation activities shall be reviewed and approved by the Underground Tanks Unit. For additional information, please call (213) 485-7543.

- An effective Transportation Demand Management program shall be implemented prior to completion of the project.

- Fire lanes, where required, and dead ending streets shall terminate in a cul-de-sac or other approved turning area. No dead ending street or fire lane shall be greater than 700 feet in length or secondary access shall be required.

- Prior to any building permits being issued, the applicant shall improve, to the satisfaction of the Fire Department, all common fire lanes and install all private fire hydrants to be required.

- Submit plot plans to the Fire Department for review and approval.

Response 5.G

These recommended mitigation measures are included in EIR Sections IV.H, Transportation/ Circulation, IV.I.1, Fire Protection, or IV.L, Risk of Upset.

Comment 5.H

The adequacy of fire protection for a given area is based on required fire-flow, response distance from existing fire stations, and this Department's judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard.

Fire-flow requirements vary from 2,000 gallons per minute (G.P.M.) in low density residential areas to 12,000 G.P.M. in high-density commercial or industrial areas. A minimum residual water pressure of 20 pounds per square inch (P.S.I.) is to remain in the water system, with the required gallons per minute flowing. The required fire-flow for this project will most likely be set at 9,000 G.P.M. from six fire hydrants flowing simultaneously.

Improvements to the water system in this area may be required to provide 9,000 G.P.M. fire-flow. The cost of improving the water system may be charged to the developer. For more detailed information regarding water main improvements, the developer shall contact the Water Services Section of the Department of Water and Power.

Response 5.H

As discussed in EIR Section IV.I.1, Fire Protection, the existing water system with proposed improvements would be expected to be provide adequate fire-flow. Nevertheless, any needed improvements to the water system serving the site would be made by the project applicant in conjunction with project site buildout.

Comment 5.I

Based on a required fire-flow of 9,000 G.P.M., the first-due Engine Company should be within 1 mile, the first-due Truck Company within 1 1/2 miles.

The Fire Department has existing fire stations at the following locations for initial response into the area of the proposed development:

Fire Station No. 79
Paramedic Engine Company
18030 S. Vermont Avenue
Gardena, CA 90247
Staffing - 4
Miles - 1.2

Fire Station No. 85
Task Force and Engine Company
Paramedic Rescue Ambulance
1331 W. 253rd Street
Harbor City, CA 90710
Staffing - 12
Miles - 4.2

Fire Station No. 38
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
124 E. "I" Street
Wilmington, CA 90744
Staffing - 12
Miles - 5.0

Fire Station No. 64
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
EMT Rescue Ambulance
118 W. 108th Street
Los Angeles, CA 90061
Staffing - 14
Miles - 6.4

Fire Station No. 49
Single Engine Company
Boats 3 and 4
Battalion 6 Headquarters
400 Yacht Street, Berth 194
Wilmington, CA 90744
Staffing - 13
Miles - 7.3

The above distances were computed to the intersections of West Knox Street and South Normandie Avenue.

Based on this criteria (response distance from existing fire stations), fire protection would be considered inadequate.

In order to mitigate the inadequacy of fire protection in travel distance, sprinkler systems will be required throughout any structure to be built, in accordance with the Los Angeles Municipal Code, Section 57.09.07.

Response 5.I

The inadequacy of response distance from existing fire stations would be mitigated through the provision of sprinkler systems in all on-site structures (see EIR Section 4.I.1, Fire Protection).

Comment 5.J

The following are additional mitigation measures recommended by the Los Angeles Fire Department:

- Submit plot plans that show the access road and the turning area for Fire Department approval.

- Private development shall conform to the standard street dimensions shown on Department of Public Works Standard Plan D-22549.

- Standard cut-corners will be used on all turns.

- During demolition, the Fire Department access will remain clear and unobstructed.

- The width of private roadways for general access use and fire lanes shall not be less than 20 feet clear to the sky.

- Fire lane width shall not be less than 20 feet. When a fire lane must accommodate the operation of Fire Department aerial ladder apparatus or where fire hydrants are installed, those portions shall not be less than 28 feet in width.

- Where access for a given development requires accommodation of Fire Department apparatus, minimum outside radius of the paved surface shall be 35 feet. An additional six feet of clear space must be maintained beyond the outside radius to a vertical point 13 feet 6 inches above the paved surface of the roadway.

- No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

- Adequate off-site public and on-site private fire hydrants may be required. Their number and location to be determined after the Fire Department's review of the plot plan

Response 5.J

These recommended mitigation measures have been incorporated into the Draft EIR (see Section IV.I.1, Fire Protection).

Comment 5.K

Comments have been provided on a pre-draft basis only, specific comments will be provided once the Environmental Impacts Report is received.

For additional information, please contact the Hydrant Unit at (213) 485-5964.

Response 5.K

No response is necessary.

LOS ANGELES POLICE DEPARTMENT (LETTER 6)

James T. McBride, Commanding Officer
LOS ANGELES POLICE DEPARTMENT

Comment 6.A

The proposed Harbor Gateway Center has been reviewed. The proposed project is located in the Los Angeles Police Department's Harbor Area. I have enclosed Reporting District (RD) information relative to crime, average crime rate per thousand persons, predominate crime, population, response time to emergency calls for service and sworn personnel statistics and information.

Response 6.A

The enclosed information regarding crime, population, response time, and sworn personnel has been incorporated into EIR Section IV.I.2, Police Protection.

Comment 6.B

A project of this size (phases I, II and III) will have a significant impact on police services, however, personnel and/or facilities increases cannot be estimated at this time.

Response 6.B

The impact of the proposed project upon police protection service is analyzed in EIR Section IV.I.2, Police Protection.

Comment 6.C

Upon completion of the project, the developer should be encouraged to provide a diagram of the project to the Commanding Officer, Harbor Area. The diagram should include access routes, building numbers and any information that might facilitate police responses.

Response 6.C

The project applicant will provide diagrams of proposed on-site development to the Police Department during the review of building permit review for individual structures.

Comment 6.D

The Los Angeles Police Department Crime Prevention Section is available to advise the developer on crime prevention features appropriate to the design of this project.

Any further questions regarding this Environmental Impact Report response should be directed to Sergeant Reid F. Morthel, Officer-In-Charge, Crime Prevention Section, at (213) 485-3134. Very truly yours,

Response 6.D

No response is necessary.

LOS ANGELES CITY PLANNING DEPARTMENT (LETTER 7)

Jack Sedwick, Principal City Planner
Los Angeles City Planning Department
221 S. Figueroa #310
Los Angeles, CA 90012

Comment 7.A

We have reviewed your Notice of Preparation for the draft Environmental Impact Report (DEIR) on the Harbor Gateway Center project. Please be advised that the Harbor Gateway Community Plan, originally adopted by the City Council on February 15, 1979, was updated under the Community Plan Update (CPU) Program. The updated Community Plan was adopted by the City Council on January 21, 1996. The Community Plan's land use designation for the proposed project is Heavy Industry, corresponding to the M3 and P zones.

Response 7.A

The land use designation and zoning for the project site are discussed in EIR Section IV.G, Land Use.

Comment 7.B

Footnote No. 5, which was revised as a part of CPU and applicable to the site, states: "Industrial areas not within specific plan study area boundaries or the area bounded by San Diego Freeway to the north, Del Amo Boulevard to the south, Western Avenue to the west, and Harbor Freeway to the east, are intended to be limited to Height District 1VL.["]

Response 7.B

The project site lies within the area bounded by the San Diego Freeway to the north, Del Amo Boulevard to the south, Western Avenue to the west, and the Harbor Freeway to the east. Therefore, it is not limited to Height District 1VL, as confirmed by Ras Cannady in a telephone conversation on July 16, 1996.

Comment 7.C

We are satisfied with your initial study checklist and its determination to prepare an EIR. We would like to review and comment on the draft EIR when it is ready.

If you have any questions or need additional information regarding our comments, please contact Ras Cannady at (213) 485-6647.

Response 7.C

No response is necessary.

CITY OF GARDENA (LETTER 8)

Kenneth W. Landau, City Manager
CITY OF GARDENA
1700 West 162nd Street
Gardena, CA 90247-3778

Comment 8.A

The City of Gardena appreciates receiving the Notice of Preparation of a Draft Environmental Impact Report for the subject project. As a neighboring city, we are indeed interested and concerned about the intensity of development being proposed for this site, as well as for the Lockheed Martin site (EIR-95-0177-SUB). When developed these two projects, both individually and cumulatively, will have significant adverse impacts on our City as well as other neighboring communities.

Of the impacts identified in the Initial Study, we are particularly concerned about traffic, air quality and public services. Project generated vehicular traffic, ingress/egress locations and demand for incremental parking will exceed the current arterial capacities of local streets and level of service at several key intersections. This level of traffic, which may be beyond mitigation, will also cause severe local air pollution conditions leading to significant deterioration of the ambient air quality. The lack of adequate provision of public safety, fire protection and emergency services for the project area by the City of Los Angeles may place an undue burden on the public safety delivery systems of neighboring cities.

Response 8.A

The proposed project's impacts upon traffic, air quality, and public services are addressed in EIR Sections IV.H, IV.B, and IV.I, respectively. Feasible measures to mitigate impacts in each of these areas are also included.

Comment 8.B

Finally, we believe the EIR must also address the economic impacts these two projects, both individually and cumulatively, will have on our local economies. As the South Bay sub-region has been one of the hardest hit areas of Los Angeles County because of the economic recession, this level of development at this location cannot but have serious consequences on our efforts to re-energize the local economy. At a time when cities in the SCAG region have placed such high priority on regional cooperation, it would behoove the EIR to address this issue of utmost concern to us.

Response 8.B

According to Section 15131 of the State CEQA Guidelines, economic and social effects are not be treated as significant effects on the environment unless they result in physical changes to the environment. Therefore, the economic impacts of the proposed project are not addressed in the EIR. The City Council will, however, consider economic and social factors as it weighs the proposed project.

Comment 8.C

Again, we appreciate this opportunity to provide our initial comments and look forward to being able to review the Draft EIR to determine to what extent our concerns have been adequately addressed. Should you have any questions regarding our concerns or need further clarification, please contact Kathy Ikari, Community Development Director at (310) 217-956 (sic).

Response 8.C

No response is necessary.

CITY OF CARSON (LETTER 9)

Patrick Brown, Community Development Director
CITY OF CARSON
701 East Carson Street
P.O. Box 6234
Carson, California 90749

Comment 9.A

The City of Carson appreciates the opportunity to comment on the subject Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Harbor Gateway Project. Staff has reviewed the material provided with the NOP, including the Project Description, Initial Study, and the possible environmental impacts.

The Draft EIR should include an evaluation of the impacts on the entrance ramps to the Harbor (I-110) and San Diego (I-405) Freeways. The Transportation Regional Traffic Analysis should also include an evaluation of the impact of this project on the extension of Del Amo Boulevard which is a major cross county arterial. The City of Carson is expected to begin construction of Del Amo Boulevard over the San Diego Freeway in February, 1997. The completion of this link will extend Del Amo Boulevard from Orange County to the segment south of the property being evaluated in the EIR. Del Amo Boulevard is on the County Master Plan and should be addressed in relation to this project.

Please forward us a copy of the Draft EIR for our review and comment as soon as it is available.

If you have any questions, please feel free to call me or Chris Ketz, Environmental Planner at (310) 952-1761.

Response 9.A

The extension of Del Amo Boulevard south of the project site was not assumed in the transportation model used for the proposed project for two reasons. First, because the extension is not fully funded, it is not considered reasonably assured of occurring, particularly since it would involve right-of-way acquisition. Second, it is unlikely that the Del Amo Boulevard extension would occur by the study year of 2006. It should, however, be noted that development of the project site would not conflict with future construction of any elements of the Master Plan of Streets and Highways.

LOCKHEED MARTIN CORPORATION (LETTER 10)

William A. Snowden, Vice President
Corporate Financial Operations
LOCKHEED MARTIN
6801 Rockledge Drive
Bethesda MD 20817

Comment 10.A

I would like to thank you for this opportunity to comment on the scope of the Environmental Impact Report ("EIR") currently proposed for the McDonnell Douglas site. As neighbors immediately west of the McDonnell Douglas property, we are understandably concerned with any potential impacts to our site that could result from development of the site and any remediation. This would include impacts to future occupants of our proposed shopping center which we anticipate will be opened for business by late 1997.

Our site and that of McDonnell Douglas were utilized for years in manufacturing aircraft parts, with certain probably (sic) contamination results. For three years, we have undertaken a detailed evaluation of contamination at our site and are currently remediating the site with the Department of Toxic Substance Control ("DTSC") as the lead agency. We assume, because of many similar uses between our property and the McDonnell Douglas facility, they will face in their investigation and remediation many of the same issues and problems we have faced over the last three years. We note from your initial study, the EIR will address past heavy industrial uses and potential site remediation with DTSC. This is certainly appropriate.

We found in our investigation that the location of contamination played a role in dictating the site plan which we developed. We assume such will be the result in this project's evaluation of contamination and remediation followed by appropriate site planning. As to the scope of review, is the entire 170-acre McDonnell Douglas site part of the environmental review or only the more limited 40-acre parcel on the northern end of the property designated on their preliminary site plan as retail? Can the investigation be piecemealed? Your consideration of our issues presented would be appreciated.

Response 10.A

The effects of on-site contamination are discussed in EIR Section IV.L, Risk of Upset. The EIR analyzes the effects of developing the entire 170-acre project site.

BOE-C6-0075659

MOOG INC. (LETTER 11)

Rika Jain, Environmental and Process Engineer
Aircraft Group
Moog Inc.
Torrance Operations
20263 Western Avenue
Torrance, CA 90501

Comment 11.A

Moog Inc., kindly submits the following concerns regarding the proposed *Harbor Gateway Center* (vesting tentative tract 52172):

- The project site has been used for several industrial operations with possible soil contamination. Moog Inc. is concerned with the potential exposure of Moog employees to hazardous materials by the dust created during earth moving/grading operations causing this contaminated soil to be air borne.

- If the soil is determined to be contaminated, any remediation activity that may result in increased dust emissions is also a concern of Moog Inc.

- The proposed site will be located in an Industrial area thus imposing increased financial burden on industries when notification for implementing required facility expansion/ changes etc.

- Several industries in the area not only handle hazardous material but also store large quantities of chemicals on their property. The impact of an accidental release of these chemicals during a seismic event or otherwise may involve a larger population than prior to this project.

Response 11.A

The effects of on-site contamination and remediation of contaminated soil and groundwater are evaluated in EIR Section IV.L, Risk of Upset. The potential exposure of people to seismic activity and related hazards is discussed in Section IV.A, Earth.

Comment 11.B

Moog Inc. has several other concerns but given the time constraints is unable to comment on other areas of concern. Moog Inc. appreciates the opportunity provided to comment on the proposed project.

If you have any questions please do not hesitate to contact Rika Jain at (310) 618-6596.

Thank you.

Response 11.B

No response is necessary.

STUART B. SCUDDER (LETTER 12)

Stuart B. Scudder
712 Elvira Ave.
Redondo Beach, CA 90277

Comment 12.A

I am the owner of property at 1519 Del Amo. I back up to the project on its southern boundaries.

The project, if properly design (sic) should have a positive effect on the area.

Response 12.A

No response is necessary.

Comment 12.B

My particular concerns relate to the southern boundary of the project. I have several questions: Will the railroad remain at its present location and will the right of way continue to be secure?

Response 12.B

The railroad at the southern end of the project site will remain at its present location and continue to be secure.

Comment 12.C

Will the masonry wall buffering the railroad from residential be raised to eight or ten feet?

Response 12.C

The development plan for the project includes a sound wall a minimum of eight feet in height along the boundary between the project site and residential properties.

Comment 12.D

Will railroad traffic be increased substantially?

Response 12.D

The proposed project is not anticipated to increase traffic on rail lines in the area. Deliveries to on-site facilities are expected to be by truck.

Comment 12.E

Please keep me informed about the design changes in Phase 3, the southern phase of the project.

Response 12.E

A more detailed description of the proposed design of Area 3 (now part of Area 2) than was provided in the Notice of Preparation is provided in EIR Section II.D, Project Characteristics. Included is a description of building heights, setbacks, landscaping, internal circulation, and other design elements.

FRED & KATHERINE HENN (LETTER 13)

Fred & Katherine Henn
1064 W. Del Amo Blvd.
Torrance, CA 90501

Comment 13.A

This property is not owned by McDonnell Douglas Realty Company and they certainly have no rights to 203rd St. What kind of dastardly trick is being pulled here anyhow.

We want any project to stop at McDonnell property (sic).

Response 13.A

The proposed project involves the redevelopment of the 170-acre McDonnell Douglas property only. It would not involve the acquisition or development of any adjacent properties.

Appendix C
Preliminary Geotechnical Investigation

Preliminary Geotechnical Investigation

Harbor Gateway Center
Normandie Avenue and West 190th Street
Los Angeles, California

Project Number 5936-96
March 18, 1996

NorCal Engineering

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10641 HUMBOLT STREET LOS ALAMITOS, CA 90720
(310) 799-9469 FAX (310) 799-9459

March 18, 1996 | Project Number 5936-96

McDonnell Douglas Realty Company
4060 Lakewood Boulevard
Lakewood, California 90808

Attn. Mr. Mario Stavale

Re: **Preliminary Geotechnical Investigation** - Proposed Harbor Gateway Center - Industrial and Retail Development - Located at the Southwest Corner of Normandie Avenue and 190th Street, in the City of Los Angeles, California

Dear Mr. Stavale:

Pursuant to your request, this firm has performed a Preliminary Geotechnical Investigation for the above-referenced property in accordance with your authorization of our proposal dated January 3, 1996. The purpose of this investigation is to evaluate the geotechnical conditions of the subject site and to provide recommendations for the proposed industrial and retail development. This geotechnical engineering report presents the findings of our study along with conclusions and recommendations.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

PROFESSIONAL ENGINEER
KEITH D TUCKER
No 841
Exp. 12-31-96
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President

Introduction

This geotechnical engineering report presents the findings of our study along with engineering analysis and preliminary recommendations for a proposed industrial and retail development on an approximately 170.2 acre site located at the southwest corner of Normandie Avenue and 190th Street in the City of Los Angeles. The purpose of this investigation was to determine the geotechnical conditions of the subsurface soils underlying the site in order to provide general recommendations for the proposed future development.

Information contained in this report has been compiled from a site reconnaissance of the property, subsurface exploration and soil sampling, laboratory testing and engineering and geological analysis. An undated aerial photograph, topographic maps of the facility and a land title survey plan prepared by Tait and Associates Inc., dated February 14, 1996, were used as references for this investigation. A preliminary site plan prepared by Phillips Brandt Reddick, Inc. dated February, 1996 was incorporated as the site plan of this study. In addition, a review of groundwater contour maps by the County of Los Angeles Department of Public Works and United States Geological Survey (USGS) Topographic Maps was also performed.

Proposed Development

It is understood that the proposed construction will consist of an industrial park development for the planned Harbor Gateway Center project. This development will consist of several office warehouse and retail buildings with associated interior street and landscape areas. It is anticipated that the proposed industrial buildings will probably consist of one to two story concrete tilt-up structures with slab-on-grade floors. Grading and foundation plans have not been made available at this time; however, it is recommended that building plans be reviewed by this office when they become available to determine if additional study or revised recommendations are pertinent for the proposed development as deemed necessary.

Site Description

The irregular L-shaped subject parcel is approximately 170 acres in area and is bounded on the north by 190th Street, residential dwellings on 203rd Street and an industrial facility to the south, Normandie Avenue and railroad spur to the east and the abandoned operations of the Industrial Light Metals facility, an operating Capital Metals facility and Western Avenue to the west. The topography of the site is relatively level with a maximum relief of a few feet in a south to north direction.

The property is currently occupied by the McDonnell Douglas - Torrance facility, an aircraft manufacturing plant which is in the process of abandoning operations. The site consists of several large metal with steel girder and masonry brick buildings within the northerly portion of the parcel which were constructed sometime between the early 1940's and mid 1960's. Some of the buildings were observed to have localized underground pits and subterranean equipment. The remaining area around the buildings is paved with concrete and asphalt pavement. The southerly portion of the parcel is occupied by a storage equipment yard with several railroad spurs for loading and unloading access. A majority of this storage area is covered at the surface with gravel. Access into the facility is provided from an interior street extending from 190th Street.

Field Investigation

The investigation consisted of the placement of fifteen subsurface exploratory borings to a maximum depth of 50 feet with a truck-mounted 2800HS hollow stem auger strategically placed throughout the property. The explorations were visually classified and logged by a field engineer and logs of the borings are attached in Appendix A. Locations of the subsurface explorations are shown on the Site Plan. Representative soil samples were recovered and transported to our laboratory for analysis and testing. The exploratory borings revealed the existing earth materials, including artificial fill and natural soil zone. These strata are described as follows:

Artificial Fill: A fill soil was encountered to an observed depth ranging from 1 to 4 feet below ground surface consisting of a dark brown to brown silty CLAY to a yellowish brown clayey SILT which were noted to be soft to stiff and moist to very moist. A pavement section consisting of an asphalt pavement overlying a layer of base material A few of the borings were observed to contain some minor gravel and small pieces of asphalt and brick.

Natural: A native and undisturbed alluvium soil consisting predominately of a dark brown to brown silty CLAY to a yellowish brown clayey SILT which were generally stiff and moist was encountered beneath the fill. A stiff sandy SILT was observed below 12 feet with a dense fine grained silty SAND encountered from 23 feet to about 42 feet below ground surface.

The overall engineering characteristics of the earth material were relatively uniform with each boring. No groundwater was encountered to the depth of our borings and no caving occurred.

Laboratory Tests

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These undisturbed samples consisted of one inch rings with inside diameter of 2.5 inches. Bulk bag samples were obtained in the upper soils for expansion index tests, maximum density tests and sulfate analysis. All test results are included in Appendix B.

A. The field moisture content (ASTM: D2216) and the dry density of the ring samples were determined in the laboratory. This data is listed on the log of borings.

B. Maximum density tests (ASTM: D1557-78) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

C. Sieve analyses (ASTM: D422-63) and the percent by weight of soil finer than the No. 200 sieve (ASTM: 1140) were performed on selected soil samples in order to assess liquefaction potential.

D. Expansion index tests in accordance with the Uniform Building Code Standard No. 29-2 were performed on remolded samples of the upper soils to determine the expansive characteristics and to provide any necessary recommendations for reinforcement of the slabs-on-grade and the foundations. Results of these tests are provided on Table II.

E. Soluble sulfate tests in accordance with EPA Method 9038 were performed on representative soils samples to estimate the potential for corrosion of concrete in contact with the on-site soils. Results are attached on Table III.

F. Direct shear tests (ASTM: D-3080) were performed on undisturbed and disturbed samples of the subsurface soils. These tests were performed to determine parameters for the calculation of the safe bearing capacity. The test is performed under saturated conditions at loads of 500 lbs./sq.ft., 1,000 lbs./sq.ft., and 2,000 lbs./sq.ft. with results shown on Plates A and B.

G. Consolidation tests (ASTM: D-2435) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates C and D.

Conclusions and Recommendations

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed development shall meet all requirements of the City Building Ordinance and will not impose any adverse effect on existing adjacent structures. The following sections present a discussion of geotechnical related requirements for specific design recommendations of different aspects of the project.

Seismicity Evaluation

The site is located within the broad alluvial plain consisting of undifferentiated late Holocene alluvium deposits. There are no known active or potentially active faults trending toward or through the site. The proposed development lies outside of any Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered remote. The site is located in an area of high regional seismicity and a maximum credible bedrock acceleration of 0.52g may occur from a Magnitude 6.6 event along the Palos Verdes Hills fault zone which is located approximately 3 miles away to the southwest. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults. The following table provides information on nearby major active faults along with peak horizontal ground accelerations.

Estimated Maximum Probable Ground Motion Parameters

Fault Zone	Approximate Distance from Site (miles)	Maximum Probable Magnitude	Peak Horizontal Acceleration (g)
Palos Verdes Hills	3 SW	6.6	0.52
Newport-Inglewood	5 NE	6.6	0.42
Whittier	18 NE	6.7	0.25
San Andreas	48 NE	8.1	0.15

Modified from Wesmousky (1986), and Ziony (1985)

Liquefaction Potential

The subject site is expected to experience ground shaking and earthquake activity that is typical of Southern California area. It is during severe ground shaking that loose, fine grained soils below the groundwater table can liquefy. A review of the exploratory boring logs and the laboratory test results on selected soil samples obtained indicate the following soil classifications, field blowcounts and amount of fines passing through the No. 200 sieve:

Location	Classification	Field Blowcounts (blowcounts/ft)	Density	Amount Passing No. 200 Sieve (%)
B-5 @ 5'	ML	36	Stiff	63
B-5 @ 10'	CL	19	Stiff	86
B-5 @ 15'	CL	23	Stiff	81
B-5 @ 20'	ML	21	Stiff	60
B-5 @ 25'	SM	59	Dense	40
B-5 @ 30'	SM	39	Dense	30
B-5 @ 35'	SM	59	Dense	19
B-5 @ 40'	SM	61	Dense	25

Our analysis indicates the potential for liquefaction at this site is considered very low due to the stiff nature of the clayey and silty soils. The groundwater depth in the vicinity is about 80 to 90 feet based upon review of the groundwater contour map dated Fall 1993 by the County of Los Angeles Department of Public Works. In addition, the potential of liquefaction is considered low as documented by the USGS Professional Paper 1360, Evaluating Earthquake Hazards in the Los Angeles Region, Figure 143.

Thus, the design of the proposed construction in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards that are typical to Southern California.

Site Grading Recommendations

Any vegetation and demolition debris shall be removed and hauled from the site prior to the start of grading operations. The upper existing fill soils (upper 1 to 4 feet) shall be removed to competent native soils, exposed surface scarified, moisture conditioned and recompacted to a minimum of 90% of the laboratory standard (ASTM D1557-78) prior to placement of any additional compacted fill soils, slabs-on-grade or pavement. In addition, overexcavation shall extend a minimum of five horizontal feet or to the depth of compacted fill placed, whichever is greater, beyond all sides of the foundations.

It should be noted that depth of overexcavation may exceed the above referenced depths due to isolated areas of as yet undiscovered low density soils. A diligent search shall be conducted during grading operations in an effort to uncover any underground structures or utility lines. If found, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. All grading operations shall be performed in accordance with the attached "Specifications for Compacted Fill Operations".

Any imported fill material should be low to moderate in expansion potential, preferably granular or similar to the upper soils encountered at the subject site. All soils shall be approved by this firm prior to importing at the site and will be subjected to additional laboratory testing to assure concurrence with the recommendations stated in this report.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

Shrinkage and Subsidence

Result of our in-place density tests reveal that the soil shrinkage will probably be on the order of 20% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of maximum dry density per ASTM standards. Subsidence should be 0.2 feet due to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements or topographic approximations. Although these values are only approximate, they represent our best estimate of lost yardage which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing using the actual equipment and grading techniques should be conducted.

Temporary Excavations

Temporary unsurcharged excavations in the existing site materials less than 5 feet high may be made at a vertical gradient unless cohesionless soils are encountered. Temporary unsurcharged excavations from 5 to 10 feet high may be trimmed at a 1/2 to 1 (horizontal to vertical) gradient. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures may require shoring, slot-cutting, or flatter excavations. The temporary cut slope gradients given do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of CAL-OSHA and other public agencies having jurisdiction.

Excavations placed adjacent to the neighboring structures for grading or new foundations may need be made utilizing the A-B-C slot-cut procedure, whereby 10 feet long sections of soils adjacent to the existing structure are alternately excavated and recompacted or footings placed prior to excavation in the subsequent slots. Slot-cuts shall be made in sections no greater than 10 feet in length and 10 feet in height and shall be observed by the geotechnical engineer. The finalized grading plan shall be reviewed by this firm to provide a more accurate recommendation regarding excavation along property line.

Foundation Design

All foundations may be designed utilizing the following safe bearing capacities for a embedded depth of 18 inches into approved compacted fill soils with the corresponding widths:

Allowable Safe Bearing Capacity (psf)

Width (ft)	Continuous Foundation	Isolated Foundation
1.5	1500	2000
2.0	1575	2075
4.0	1875	2375
6.0	2000	2500

A one third increase may be used when considering short term loading from wind and seismic forces. All continuous foundations shall be reinforced a minimum of one #4 bar, top and bottom. Isolated foundations shall be reinforced at the discretion of the project structural engineer.

Lateral Resistance

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the current Uniform Building Code should be adhered to when the coefficient of friction and passive pressures are combined:

Coefficient of Friction - 0.35

Equivalent Passive Fluid Pressure = 200 lbs./cu.ft.

Maximum Passive Pressure = 2,000 lbs./sq.ft.

The passive pressure recommendations are valid only for competent native material and/or compacted fill soils.

Settlement Analysis

Resultant pressure curves for the consolidation tests are shown on Plate B. Computations utilizing these curves and the recommended safe bearing capacities reveal that the foundations will experience settlements on the order of 1/2 inch and differential settlements of less than 1/4 inch.

Corrosion Design Criteria

Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations, revealed high levels of sulfate concentrations. The sulfate concentration of the soils tested was 230 and 1,600 parts per million (ppm). Therefore, special cement recommendations are deemed necessary for building foundations at this time. However, additional sulfate testing shall be performed at the conclusion of rough grading operation to verify with these conclusions. Sulfate test results may be found on the attached Table III.

Retaining Wall Design Parameters

Active earth pressures against retaining walls will be equal to the pressures developed by the following fluid densities. These values are for **granular free draining** backfill material placed adjacent to the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical)	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. A backfill zone of non-expansive material shall consist of a wedge beginning a minimum of one horizontal foot from the base of the wall extending upward at an inclination no less than 3/4 to 1 (horizontal to vertical). All walls shall be waterproofed and protected from hydrostatic pressure by a reliable permanent subdrain system.

Slab Recommendations

All concrete slabs-on-grade shall be a minimum of five inches in thickness, reinforced a minimum of No. 4 bars eighteen inches in each direction, positioned in the center of the slab. The project Structural Engineer should review all proposed loads to be imposed for further recommendations regarding slab thickness and steel reinforcement. Any concrete slabs with moisture sensitive floor coverings should be underlain by an impervious membrane. The membrane shall consist of visqueen at least 6 mils in thickness and should be sandwiched between or covered with four inches of sand. All slab areas shall be premoistened to 130% of the optimum moisture content to a depth of eighteen inches prior to pouring concrete. All concrete slab areas to receive floor coverings should be moisture tested to meet all manufacturer requirements prior to placement.

Preliminary Pavement Design

The table below provides a preliminary pavement design based upon an estimated R-Value of 20 for the proposed industrial and retail developments and interior streets. Final pavement design should be based on R-Value testing of the subgrade soils near the conclusion of rough grading to assure that these soils are consistent with those assumed in this preliminary design.

PRELIMINARY ASPHALT PAVEMENT DESIGN

Type of Traffic	Traffic Index	Asphaltic Concrete (in)	Base Material (in)
Automobile Parking Stalls	4.0	3.0	5.0
Automobile Drive Circulation Areas	5.0	3.0	8.0
Medium Truck Access Areas (GVW < 42,000 lbs.; 3 axle)	6.0	3.5	10.0
Heavy Trucks Access Areas (GVW < 90,000 lbs.; 5 axle)	7.0	3.5	14.0
Interior Streets	8.0	4.0	16.5

Any concrete slabs utilized for heavy trucks and forklifts shall be a minimum of six inches in thickness and placed on approved fill soils recompacted to a minimum of 95% relative compaction. Any approved base material shall consist of a Class II aggregate or equivalent and should be compacted to a minimum of 95% relative compaction.

All pavement materials shall conform to the requirements set forth by the City of Los Angeles. The base material and asphaltic concrete should be tested prior to delivery to the site and during placement to assure conformance with the project specifications. A pavement engineer shall designate the specific asphalt mix design to meet the required project specifications.

Limitations

The recommendations and conclusions contained in this report are based upon the geotechnical conditions uncovered in our test excavations. No warranty of the geotechnical condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected or unfavorable conditions are encountered during the construction phase. It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project.

This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project. A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, and geotechnical engineer to clarify any questions relating to the subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied with in the field.

The geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Preparation

Any existing low density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-78).

Material For Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 24 hours prior to importation on site.

Placement of Compacted Fill Soils

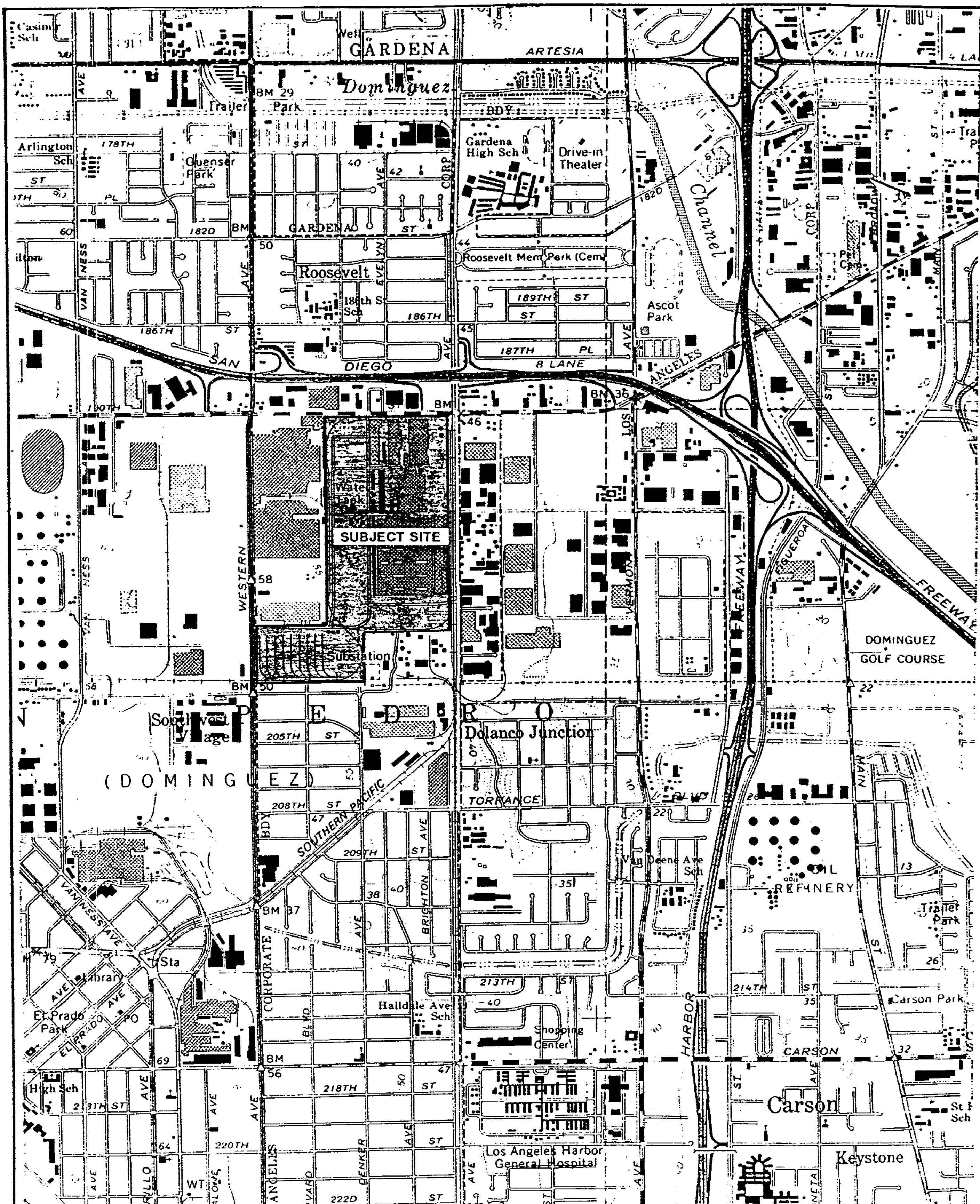
The approved fill soils shall be placed in layers not in excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 15% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-78) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24 hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

MCDONNELL DOUGLAS

PROJECT 5936-96 | **DATE** MARCH 1996

TORRANCE QUADRANGLE
CALIFORNIA–LOS ANGELES CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

APPENDICES

(In order of appearance)

Appendix A - Logs of Test Explorations

* Log of Borings B-1 to B-15

Appendix B - Laboratory Tests

* Table I - Maximum Density Tests
* Table II - Expansion Tests
* Table III - Sulfate Tests

* Plates A and B- Direct Shear Tests
* Plates C and D- Consolidation Tests

APPENDIX A

NorCal Engineering

MAJOR DIVISIONS			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN 200 SIEVE SIZE)	GRAVELS (MORE THAN 50% OF COARSE FRACTION IS LARGER THAN THE NO. 4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
		GRAVELS WITH FINES (APPRECIABLE AMT. OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES.
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.
	SANDS (MORE THAN 50% OF COARSE FRACTION IS SMALLER THAN THE NO. 4 SIEVE SIZE)	CLEAN SANDS	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
		SANDS WITH FINES (APPRECIABLE AMT. OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES.
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES.
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN 200 SIEVE SIZE	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY.
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS
	SILTS AND CLAYS (LIQUID LIMIT MORE THAN 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

BOUNDARY CLASSIFICATIONS: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS.

NorCal Engineering
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UNIFIED SOIL CLASSIFICATION SYSTEM

PROJECT | DATE

	MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.	ELEVATION (FEET)
					0	Artificial Fill Silty CLAY to Clayey SILT, dark brown to brown, stiff, moist, occasional minor gravel and pieces of brick	
	17.4	99.9	8/11	R			
	23.8	105.3	12/12	R	5	Natural Silty CLAY, dark brown, stiff, moist	
	22.8	107.7	7/17	R	10	Silty CLAY, yellowish brown, stiff, moist	
						Sandy SILT, yellowish brown, stiff, moist	
	20.2	103.7	9/15	R	15		
	33.3	90.4	10/14	R	20		
					25		
					30		
					35		

SAMPLE TYPES

C Rock Core
S Standard Split Spoon
R Ring Sample
B Bulk Sample
J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800 HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 DATE

LOG OF BORING #1

BOE-C6-0075687

	MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
					0	Asphalt Pavement (5 1/2" thick) Base Material (5" thick)	48
						Artificial Fill Silty CLAY, dark brown, stiff, moist	
	17.9	101.8	8/13	R	5	Natural Silty CLAY, brown, stiff, moist	
					10		
					15		
					20		
					25		
					30		
					35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 DATE

LOG OF BORING #2

BOE-C6-0075688

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt Pavement (6" thick)/Base Material (8" thick)	48
					Artificial Fill Silty CLAY, dark brown, stiff, moist	
20.2	105.4	6/7	R	5	Natural Silty CLAY, dark brown, stiff, moist	
14.7	117.5	9/25	R	10	Sandy SILT, yellowish brown, stiff, moist	
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
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PROJECT 5936-96 | DATE

LOG OF BORING #3

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
					THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.	
				0	Asphalt Pavement (5" thick)/Base Material (7" thick)	51
15.2	101.9	8/11	R			
					Artificial Fill Silty CLAY, dark brown, stiff, moist, occasional small gravel	
				5		
					Natural Silty CLAY, dark brown, stiff, moist	
					Sandy SILT, yellowish brown, stiff, moist	
14.7	109.6	12/13	R			
				10		
				15		
				20		
				25		
				30		
				35		

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
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PROJECT 5936-96 | DATE

LOG OF BORING #4

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt Pavement(5" thick)/Base Material (6"thick)	51
16.2	105.4	14/15	B/R		Natural Silty CLAY, dark brown, stiff, moist	
15.0	115.2	17/19	R	5	Clayey SILT, yellowish brown, stiff, moist	
15.4	113.0	7/12	R	10		
19.0	102.9	8/15	R	15		
					Sandy SILT, yellowish brown, stiff, moist	
16.1	109.5	7/15	R	20		
					SAND, fine grained, silty, tannish brown, dense, moist	
16.4	114.7	25/36	R	25		
11.6	106.3	13/26	R	30		
9.4	100.8	26/35	R	35	(continued on next page)	

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
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PROJECT 5936-96 | DATE

LOG OF BORING #5

BOE-C6-0075691

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				35	Natural SAND, fine grained, silty, tannish brown, dense, moist	
10.7	110.7	24/37	R	40		
					SAND, fine grained, clayey, brown, dense, moist	
				45		
15.6	112.7	25/35	R	50	END OF BORING	
				55		
				60		
				65		
				70		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/4/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

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LOG OF BORING #5 contd.

PROJECT 5936-96 DATE

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt (6" thick)/Base Material (6" thick)	51
					Artificial Fill Silty CLAY to Clayey SILT, dark brown to yellowish brown, firm to stiff, moist	
20.8	102.7	7/13	R	5		
					Natural Silty CLAY, dark brown, stiff, moist	
15.9	110.9	12/15	R	10	Clayey SILT, yellowish brown, stiff, moist	
					Sandy SILT, yellowish brown, stiff, moist	
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING #6

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Artificial Fill Silty CLAY, dark brown, soft, very moist	55
17.9	103.2	8/13	R			
					Natural Silty CLAY, dark brown, stiff, moist	
				5	Clayey SILT, yellowish brown, stiff, moist	
14.8	114.1	17/20	R	10		
					Sandy SILT, yellowish brown, stiff, moist	
				15		
16.0	113.7	10/12	R	20		
				25	SAND, fine grained, silty, tannish brown, dense,moist	
11.2	105.9	15/21	R	30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING #7

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Artificial Fill Silty CLAY to Clayey SILT, dark brown, firm moist with minor pieces of asphalt and gravel	
20.8	108.9	8/13	R	5	Natural Silty CLAY, dark brown, stiff, moist	
24.3	99.4	6/17	R	10	Clayey SILT, yellowish brown, stiff, moist	
9.9	118.6	14/21	R	15	Sandy SILT, yellowish brown, stiff, moist	
12.9	123.4	27/43	R	20	Clayey SILT, yellowish brown, stiff, moist	
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 DATE

LOG OF BORING #8

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Artificial Fill Silty CLAY to Clayey SILT, dark brown to yellowish brown, firm, moist	48
					Natural Silty CLAY, dark brown, stiff, moist	
				5	Clayey SILT, yellowish brown, stiff, moist	
				10		
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/13/96
EQUIPMENT USED: Hand Auger
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING #9

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Artificial Fill Silty CLAY, dark brown, soft, moist	
17.1	102.7		R			
					Natural Silty CLAY, dark brown, stiff, moist	
				5		
					Clayey SILT, yellowish brown, stiff, moist	
20.7	103.9		R	10		
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/13/96
EQUIPMENT USED: Hand Auger
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

LOG OF BORING #10

PROJECT 5936-96 DATE

BOE-C6-0075697

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt Pavement (2 1/2" thick)/Base Material (6" thick)	52
					Artificial Fill Silty CLAY, dark brown, stiff, moist	
				5	Natural Silty CLAY, dark brown, stiff, moist	
				10	Clayey SILT, yellowish brown, stiff, moist	
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING #11

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
					THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.	
				0	Asphalt Pavement (4 1/2" thick)/Base Material (3" thick)	51
19.7	103.7	7/15	R			
					Natural Silty CLAY, dark brown, stiff, moist	
				5		
19.9	101.8	10/12	R		Clayey SILT, yellowish brown, stiff, moist	
24.7	102.7	11/17	R	10		
				15	Sandy SILT, yellowish brown, stiff, moist	
13.2	114.7	17/24	R	20		
				25		
				30		
				35		

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

LOG OF BORING #12

PROJECT 5936-96 | DATE

	MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.	ELEVATION (FEET)
					0	Artificial Fill Silty CLAY, brown, soft, very moist	
					5	Natural Silty CLAY, dark brown, stiff, moist	
						Clayey SILT, yellowish brown, stiff, moist	
					10		
					15		
					20		
					25		
					30		
					35		

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/13/96
EQUIPMENT USED: Hand Auger
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING #13

BOE-C6-0075700

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt Pavement (5 1/2" thick)/Base Material (2 1/2" thick)	50
					Natural Silty CLAY, dark brown, stiff, moist	
				5	Clayey SILT, yellowish brown, stiff, moist	
					Sandy SILT, yellowish brown, stiff, moist	
				10		
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96

EQUIPMENT USED: Simco 2800HS

GROUNDWATER LEVEL: Not encountered

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

LOG OF BORING#14

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	Asphalt Pavement (3 1/2" thick)/Base Material (4" thick)	51
14.0	111.7	11/14	R/B		Natural Silty CLAY, dark brown, stiff, moist	
				5	Clayey SILT, yellowish brown, stiff, moist	
				10		
				15		
				20		
				25		
				30		
				35		

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

SAMPLE TYPES

- C Rock Core
- S Standard Split Spoon
- R Ring Sample
- B Bulk Sample
- J Jar Sample

DATE DRILLED: 3/5/96
EQUIPMENT USED: Simco 2800HS
GROUNDWATER LEVEL: Not encountered

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

LOG OF BORING #15

PROJECT 5936-96 | DATE

Project Number 5936-96

APPENDIX B

NorCal Engineering

TABLE I
MAXIMUM DENSITY TESTS
(ASTM: D-1557-78)

Sample	Classification	Optimum Moisture	Maximum Dry Density (lbs./cu.ft.)
B1 @ 2'	Silty CLAY	14.0	110.0
B5 @ 2'	Silty CLAY	13.0	112.0
B15 @ 3'	Clayey SILT	12.0	121.0

TABLE II
EXPANSION INDEX TESTS
(U.B.C. STD. 29-2)

Sample	Classification	Expansion Index
B1 @ 2'	Silty CLAY	60
B5 @ 2'	Silty CLAY	53
B15 @ 3'	Clayey SILT	37

TABLE III
SULFATE TEST RESULTS

Sample	Sulfate Concentrations (ppm)
B1 @ 2'	1,600
B5 @ 2'	230

ppm: mg/kg

Calscience
Environmental
Laboratories, Inc.

ACCREDITED

ANALYTICAL REPORT

Norcal Engineering, Inc.		Date Sampled:	03/06/96
10641 Humbolt Street		Date Received:	03/14/96
Los Alamitos, CA 90720		Date Analyzed:	03/15/96
		Work Order No.:	96-03-248
Attn:	Scott Spensiero	Method:	EPA 9038
RE:	McDonald Douglas/5936-96	Page 1 of 1	

All concentrations are reported in mg/kg (ppm).

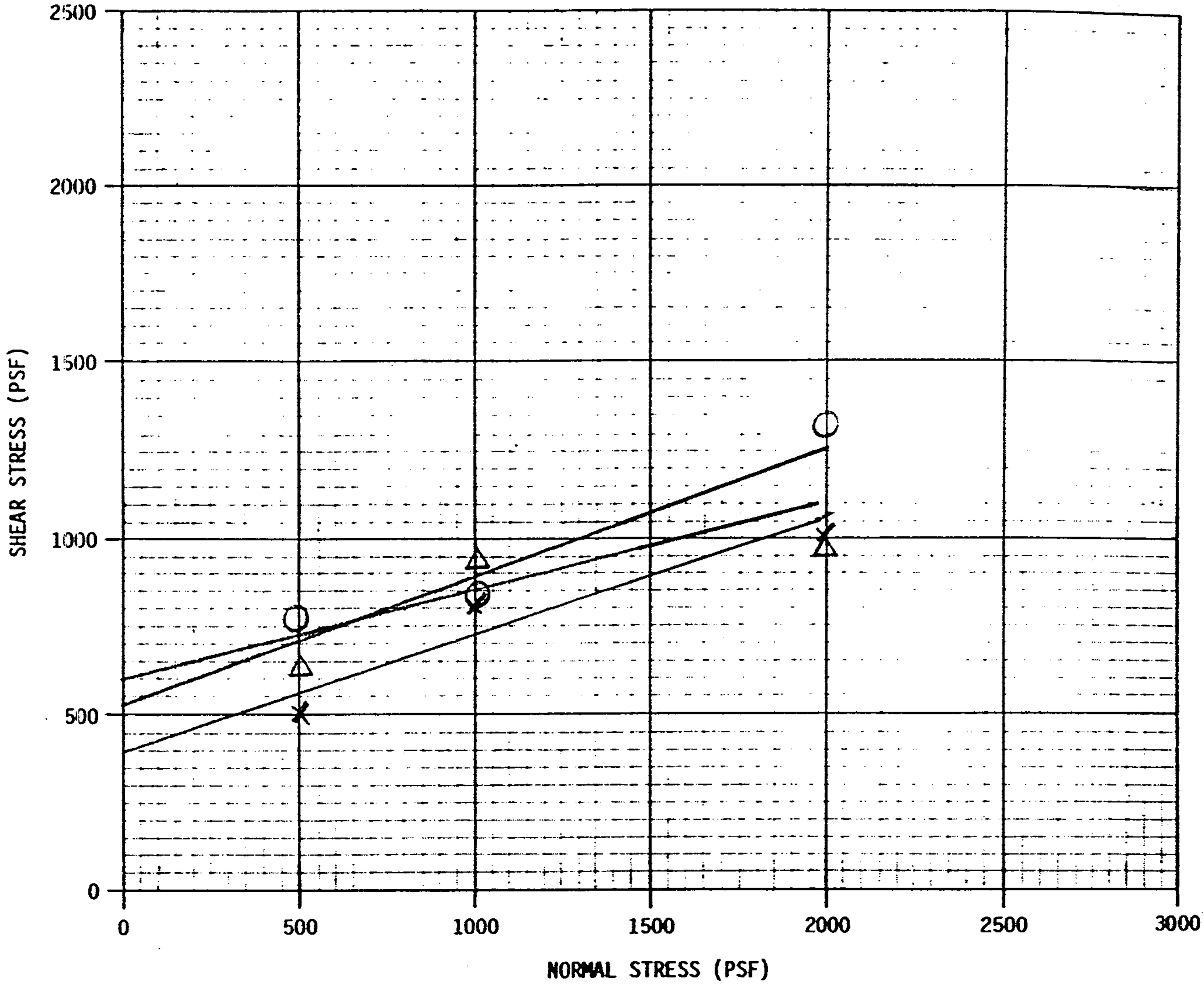
Sample Number	Sulfate Concentration	Reportable Limit
#1	1600	100
#2	230	20

Reviewed and Approved [signature] on 03/15/1996
William H. Christensen
Deliverables Manager

ND denotes not detected at indicated reportable limit.

Each sample was received by CEL chilled, intact, and with chain-of-custody attached.

7440 Lincoln Way, Garden Grove, CA 92641-1432 • TEL (714) 895-5494 • FAX (714) 894-7501



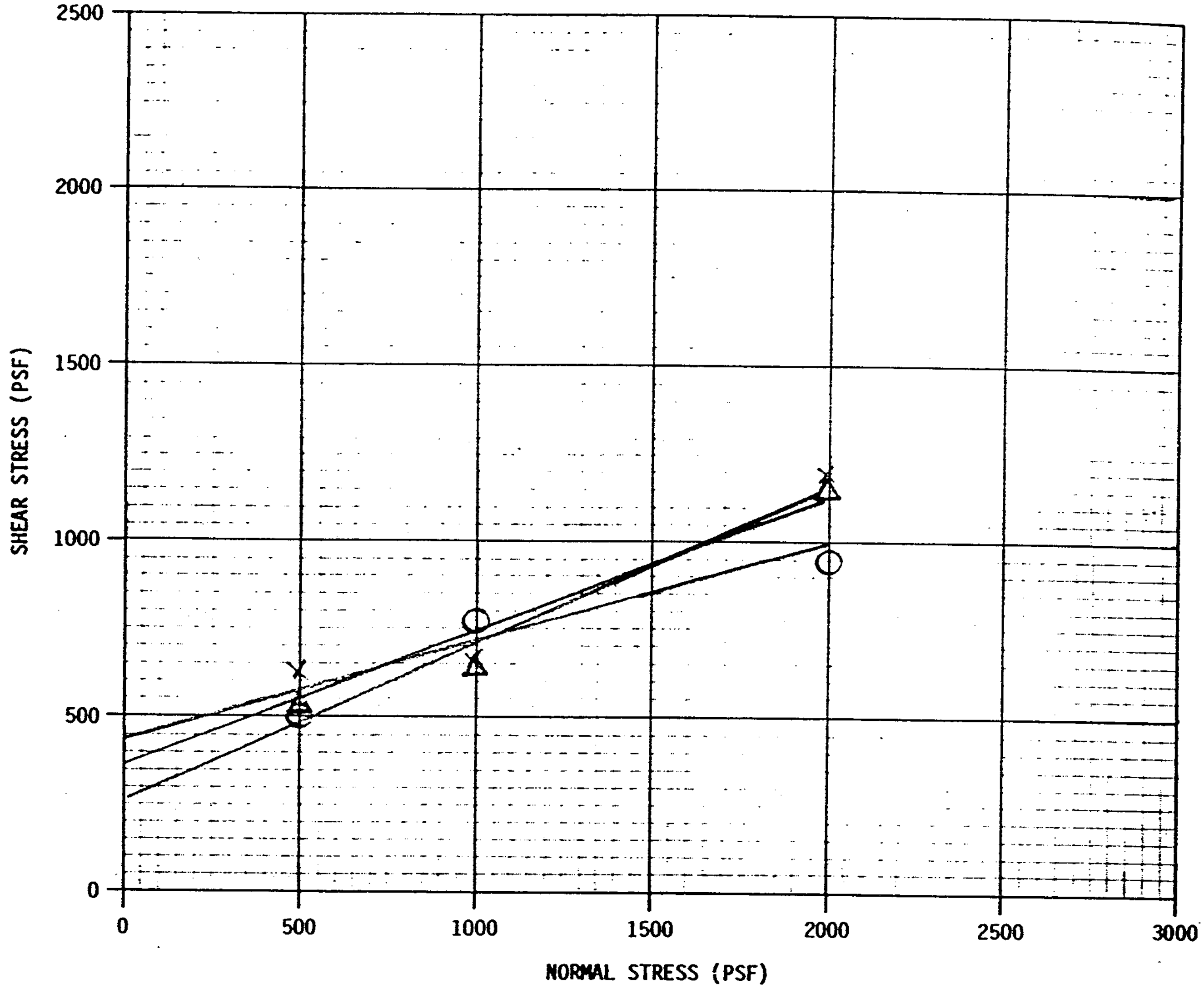
SYMBOL	BORING NUMBER	DEPTH (FEET)	ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	1	2.0	17	400	99.9	17.4
O	5	2.5	19	550	105.4	16.2
Δ	7	3.0	13	600	103.2	17.9
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
TESTS PERFORMED ON UNDISTURBED SAMPLES UNLESS SHOWN BELOW.
(R) SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

DIRECT SHEAR TEST RESULTS
PLATE A



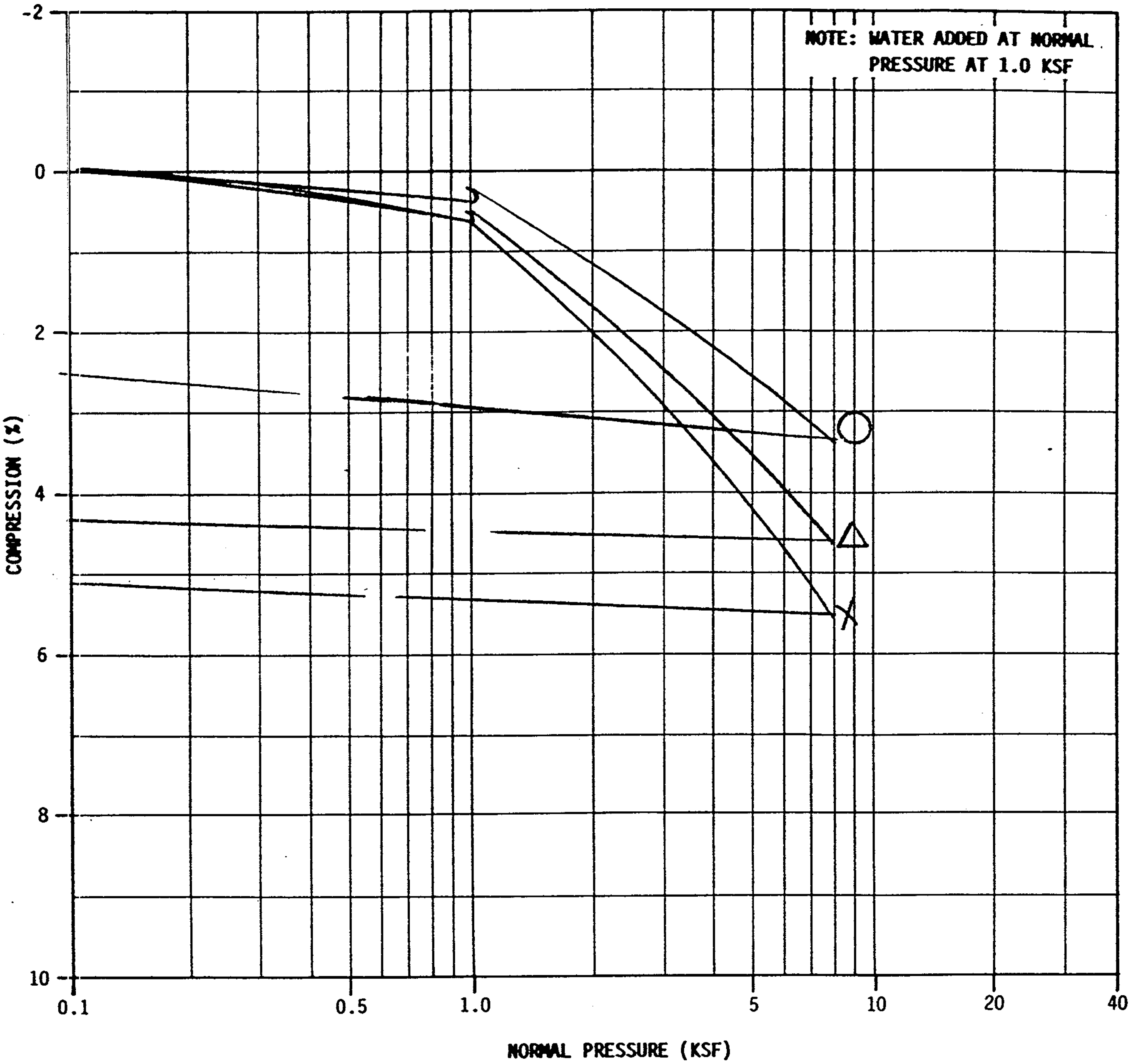
SYMBOL	BORING NUMBER	DEPTH (FEET)	Ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	10	2.0	20	375	102.7	17.1
O	12	2.5	15	450	103.7	19.7
Δ	15	3.5	23	275	111.7	14.0
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
TESTS PERFORMED ON UNDISTURBED SAMPLES UNLESS SHOWN BELOW.
(R) SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

DIRECT SHEAR TEST RESULTS
PLATE B



SYMBOL	BORING NUMBER	DEPTH (FEET)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)
X	1	2.0	90.4	33.3		
O	3	10	117.5	14.7		
△	5	15	102.9	19.0		
□						

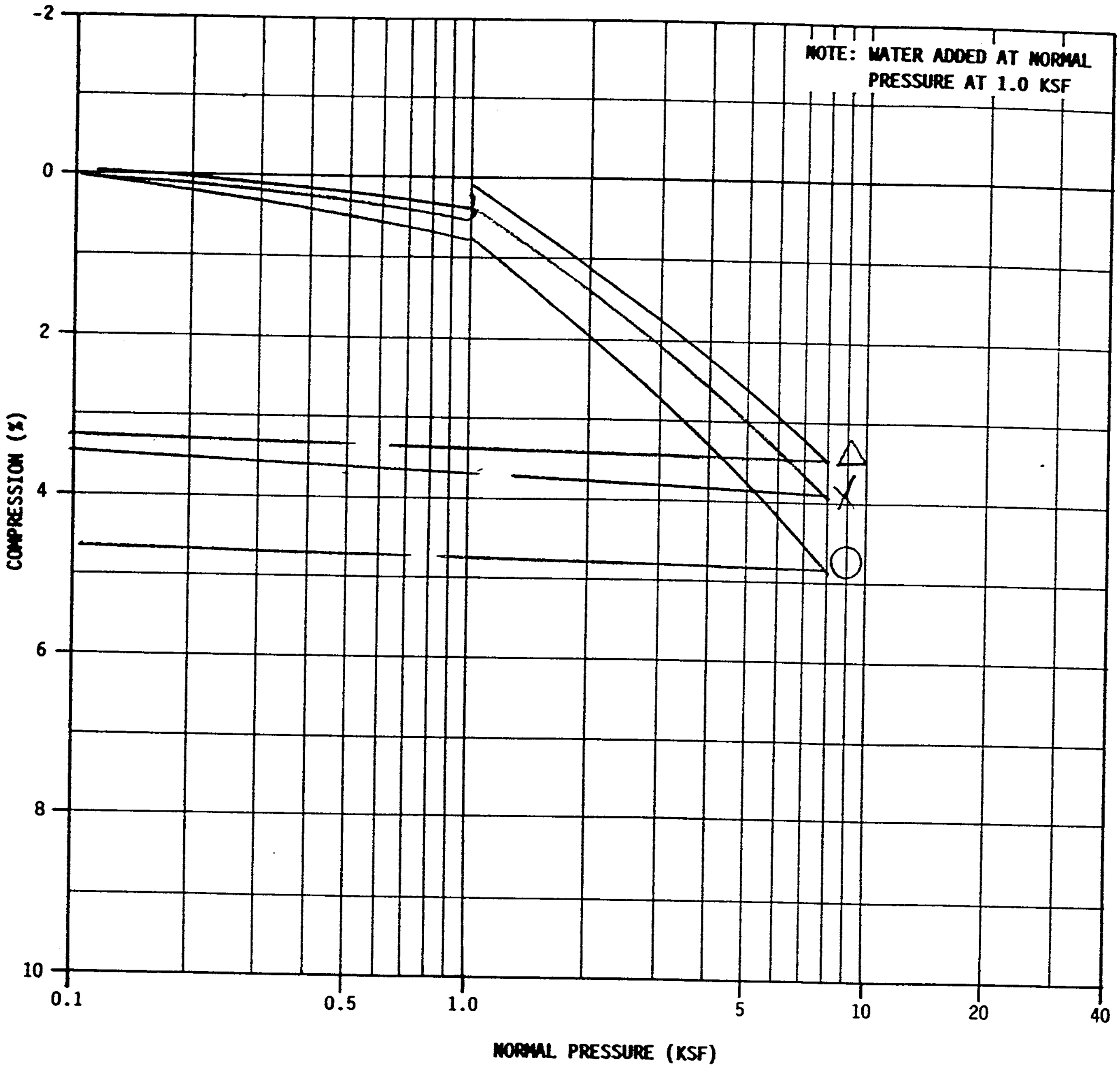
——— COMPRESSION (FM) FIELD MOISTURE - NO WATER ADDED

— — — REBOUND (R) SAMPLE REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 DATE

CONSOLIDATION TEST RESULTS
PLATE C



SYMBOL	BORING NUMBER	DEPTH (FEET)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)
X	8	5	108.9	20.8		
O	10	7.5	101.8	19.9		
Δ	15	3.5	111.7	14.0		
□						

——— COMPRESSION (FM) FIELD MOISTURE - NO WATER ADDED

– – – REBOUND (R) SAMPLE REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5936-96 | DATE

CONSOLIDATION TEST RESULTS
PLATE D

Appendix D
Air Quality Worksheets

REGIONAL EMISSION CALCULATIONS

Harbor Gateway -- McDonnell Douglas
Electric and Natural Gas Usage

changed to numbers from energy section

Land Use	Units	Electricity Usage Rate* (kWh\ft2\year)	Total Electricity Usage (KWh\year)	(KWh\Day)	
Retail	355,000	13.55 retail		0	365 working days/yr
Theater	65,000	10.5 misc		0	365 working days/yr
Restaurants	30,000	47.45 restaurant		0	365 working days/yr
Office	507,000	12.95 office		0	260 working days/yr
Industrial Park	2,010,700	4.35 warehouse	39,710,000	152,731	260 working days/yr
Total (not including existing)	2,967,700		39,710,000	152,731	260 working days/yr
Existing Warehouse	2,419,000	4.35 warehouse	18,740,000	72,077	260 working days/yr

*SCAQMD AIR QUALITY HANDBOOK, TABLE A9-11-A

Land Use	Natural Gas Usage Rate* (ft3\ft2\month)	Total Natural Gas Usage (ft3\ft2\month)	(ft3\ft2\day)	
Retail	2.9 retail		0	30 working days/mo
Theater	2.9 retail		0	30 working days/mo
Restaurants	9.6 2xHotel		0	30 working days/mo
Office	2 office		0	22 working days/mo
Industrial Park	2 office	6,341,667	288,258	22 working days/mo
Existing Warehouse	2 office	1,108,333	50,379	22 working days/mo

*SCAQMD AIR QUALITY HANDBOOK, TABLE A9-12-A

Emissions from Electricity Consumption (lbs per MWh/day)

	CO	ROC	NOx	SOx	PM10
Emission Factor (lbs/MWh)*	0.2	0.01	1.15	0.12	0.04
Land Use					
Retail	0.00	0.00	0.00	0.00	0.00
Theater	0.00	0.00	0.00	0.00	0.00
Restaurants	0.00	0.00	0.00	0.00	0.00
Office	0.00	0.00	0.00	0.00	0.00
Industrial Park	30.55	1.53	175.64	18.33	6.11
Total (not including existing)	31	2	176	18	6
Existing Warehouse	14.42	0.72	82.89	8.65	2.88

*SCAQMD AIR QUALITY HANDBOOK, TABLE A9-11-B

Emissions from Natural Gas Consumption (lbs per ft3/day)

	CO	ROC	NOx	SOx	PM10
Emission Factor (lbs/million ft3)*	20	5.3	120	Neg.	0.2
Land Use					
Retail	0.00	0.00	0.00	0.00	0.00
Theater	0.00	0.00	0.00	0.00	0.00
Restaurants	0.00	0.00	0.00	0.00	0.00
Office	0.00	0.00	0.00	0.00	0.00
Industrial Park	5.77	1.53	34.59	0.00	0.06
Total (not including existing)	6	2	35	0	0
Existing Warehouse	1.01	0.27	6.05	0.00	0.01

*SCAQMD AIR QUALITY HANDBOOK, TABLE A9-12-B

Harbor Gateway – McDonnell Douglas

	Area 1 Retail	Area 2 Office\Industrial	Total Project	Existing Warehouse
Total Trips*	13,550	16,350	29900	8,560
Non–Work Trips*	61%	61%		61%
Work Trips*	39%	39%		39%
ADT Non–Work	8,276	9,987		5,228
ADT Work	5,263	6,350		3,325
Pass–by*	36%	0%		0%
Pass–by Non–work Trips	2,950	0		0
ADT less Pass–by / Non–work	5,326	9,987		5,228
Total Trips	10,589	16,337		8,553
Non–Work Trips (miles/trip)	6.20	6.20		6.20
Work Trips (miles/trip)	10.60	10.60		10.60
Non–work trips (miles)	33,021	61,919		32,414
Work Trips (miles)	55,788	67,310		35,245
Total VMT	88,809	129,229		67,659
Number of Daily Trips (ADT)				
Arrivals	6,770	8,169		4,277
Departures	6,770	8,169		4,277
Total	13,539	16,337		8,553
Vehicle–Days	5,295	8,169		4,277
Trip–ends	10,589	16,337		8,553
Average Trip Length*	6.56	7.91	*SCAQMD AIF	7.91
Vehicle Miles Traveled	88,809	129,229		67,659
Emission Factors (EMFAC7F)				
CO (gm/mile)	6.13	6.13		6.13
NOx (gm/mile)	1.04	1.04		1.04
PM10				
Exhaust (g/mile)	0.05	0.05		0.05
Tire Wear (g/mile)	0.19	0.19		0.19
ROG				
Exhaust (g/mile)	0.51	0.51		0.51
Hot Soak (gm/trip–end)	0.29	0.29		0.29
Diurnal (gm/veh–day)	0.46	0.46		0.46
Resting losses (gm/veh–day)	0.18	0.18		0.18
SOx (gm/mile)	0.08	0.08		0.08
Emissions				
CO (lbs/day)	1199	1745		914
NOx (lbs/day)	203	296		155
PM10				
Exhaust (lbs/day)	10	14		7
Tire Wear (lbs/day)	37	54		28
ROG				
Exhaust (lbs/day)	100	145		76
Hot Soak (lbs/day)	7	10		5
Diurnal (lbs/day)	5	8		4
Resting losses (lbs/day)	2	3		2
SOx (lbs/day)	16	23		12
Total Emissions				
CO (lbs/day)	1,199	1,745	2944	914
NOx (lbs/day)	203	296	499	155
PM10 (lbs/day)	47	68	115	35
ROG (lbs/day)	114	166	280	87
SOx (lbs/day)	16	23	39	12

18–Nov–96

Cumulative Stationary Emissions (Not including the proposed project)
Daily Emissions

	Electricity Consumption (KWH/YR)	Emission Factors* (LBS/MWH) CO	ROC	NOx	SOx	PM10
		0.2	0.01	1.15	0.12	0.04
		Emissions				
Office	3,931,931	3.02	0.15	17.39	1.81	0.60
Retail	50,200,907	38.62	1.93	222.04	23.17	7.72
Industrial	31,470,558	24.21	1.21	139.20	14.52	4.84
SF Residential	258,819	0.14	0.01	0.82	0.09	0.03
MF Residential	4,264,887	2.34	0.12	13.44	1.40	0.47
Church	378,987	0.29	0.01	1.68	0.17	0.06
Hospital	4,763,801	2.61	0.13	15.01	1.57	0.52
Theater	826,875	0.45	0.02	2.61	0.27	0.09
Auto Service	149,100	0.08	0.00	0.47	0.05	0.02
Gymnasium	167,412	0.09	0.00	0.53	0.06	0.02
TOTAL	**96,078,453**	**72**	**4**	**412**	**43**	**14**

	Natural Gas Consumption (CF/MO)	Emission Factors* (LBS/MIL CF) CO	ROC	NOx	SOx	PM10
		20.00	5.30	120.00	0.00	0.20
		Emissions		80.00		
Office	607,248	0.56	0.15	3.39	0.00	0.01
Retail	10,744,106	9.99	2.65	59.97	0.00	0.10
Industrial	5,994,392	5.58	1.48	33.46	0.00	0.06
SF Residential	92	0.00	0.00	0.00	0.00	0.00
MF Residential	1,516	0.00	0.00	0.00	0.00	0.00
Church	72,188	0.07	0.02	0.40	0.00	0.00
Hospital	439,060	0.29	0.08	1.76	0.00	0.00
Theater	157,500	0.11	0.03	0.63	0.00	0.00
Auto Service	28,400	0.02	0.01	0.11	0.00	0.00
Gymnasium	31,888	0.02	0.01	0.13	0.00	0.00
TOTAL	**18,012,614**	**17**	**4**	**100**	**0**	**0**
COMBINED TOTAL		**88**	**8**	**512**	**43**	**15**

*Emission Factors Dervied from the SCAQMD CEQA Air Quality Handbook, 1993

Harbor Gateway	Cumulative Emissions (Not including the proposed project)										
Landuse	Office Park	Retail	Industrial	SF Residentia	MF Residenti	Church	Gymnasium	Hospital	Theater	Auto Service	Total
Units	303,624	3,704,864	2,997,196	46	758	36,094	15,944	219,530	78,750	1	
ADT	11.42	42.02	6.97	9.55	5.68	9.32	12.14	16.78	77.79	748	
Total Trips*	3,467	155,678	20,890	439	4,305	336	194	3,684	6,126	748	
Non–Work Trips*	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	
Work Trips*	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	
ADT Non–Work	1,347	60,465	8,114	171	1,672	131	75	1,431	2,379	291	
ADT Work	2,118	95,088	12,760	268	2,630	205	118	2,250	3,742	457	
Pass–by*	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Pass–by Non–work Trips	0	0	0	0	0	0	0	0	0	0	
ADT less Pass–by / Non–work	1,347	60,465	8,114	171	1,672	131	75	1,431	2,379	291	
Total Trips	3,465	155,553	20,874	439	4,302	336	193	3,681	6,121	748	
Non–Work Trips (miles/trip)	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	
Work Trips (miles/trip)	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	
Non–work trips (miles)	8,351	374,883	50,307	1,060	10,366	812	465	8,872	14,750	1,804	
Work Trips (miles)	22,451	1,007,933	135,256	2,841	27,878	2,173	1,251	23,850	39,665	4,844	
Total VMT	30,802	1,382,816	185,563	3,901	38,244	2,985	1,716	32,722	54,415	6,648	
Number of Daily Trips (ADT)											
Arrivals	1,733	77,777	10,437	220	2,151	168	97	1,841	3,061	374	
Departures	1,733	77,777	10,437	220	2,151	168	97	1,841	3,061	374	
Total	3,465	155,553	20,874	439	4,302	336	193	3,681	6,121	748	
Vehicle–Days	1,733	77,777	10,437	220	2,151	168	97	1,841	3,061	374	
Trip–ends	3,465	155,553	20,874	439	4,302	336	193	3,681	6,121	748	
Average Trip Length*	8.89	8.89	8.89	8.89	8.89	8.88	8.89	8.89	8.89	8.89	
Vehicle Miles Traveled	30,802	1,382,816	185,563	3,901	38,244	2,985	1,716	32,722	54,415	6,648	
Emission Factors (EMFAC7F)											
CO (gm/mile)	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	
NOx (gm/mile)	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	
PM10											
Exhaust (g/mile)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Tire Wear (g/mile)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	
ROG											
Exhaust (g/mile)	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	
Hot Soak (gm/trip–end)	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	
Diurnal (gm/veh–day)	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Resting losses (gm/veh–day)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	
SOx (gm/mile)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
Emissions											
CO (lbs/day)	416	18671	2506	53	516	40	23	442	735	90	23446
NOx (lbs/day)	71	3168	425	9	88	7	4	75	125	15	3979
PM10											0
Exhaust (lbs/day)	3	152	20	0	4	0	0	4	6	1	190
Tire Wear (lbs/day)	13	579	78	2	16	1	1	14	23	3	728
ROG											
Exhaust (lbs/day)	35	1553	208	4	43	3	2	37	61	7	
Hot Soak (lbs/day)	2	99	13	0	3	0	0	2	4	0	
Diurnal (lbs/day)	2	79	11	0	2	0	0	2	3	0	
Resting losses (lbs/day)	1	31	4	0	1	0	0	1	1	0	
SOx (lbs/day)	5	244	33	1	7	1	0	6	10	1	
Total Emissions											
CO (lbs/day)	416	18,671	2,506	53	516	40	23	442	735	90	23446
NOx (lbs/day)	71	3,168	425	9	88	7	4	75	125	15	3979
PM10 (lbs/day)	16	731	98	2	20	1	1	18	29	4	918
ROG (lbs/day)	40	1,762	236	4	49	3	2	42	69	7	2210
SOx (lbs/day)	5	244	33	1	7	1	0	6	10	1	308

Cumulative Operational Air Emissions

MOBILE	Project	Related	Existing	Total
CO (lbs/day)	2944	23446	914	25476
NOx (lbs/day)	499	3979	155	4323
PM10 (lbs/day)	115	918	35	998
ROG (lbs/day)	280	2210	87	2403
SOx (lbs/day)	39	308	12	335

STATIONARY	Project	Related	Existing	Total
CO (lbs/day)	37	88	15.4	109.6
NOx (lbs/day)	211	512	89	634
PM10 (lbs/day)	6	15	2.6	18.4
ROG (lbs/day)	4	8	1	11
SOx (lbs/day)	18	43	8.7	52.3

Combined Total Emissions	Project	Related	Existing	Total
CO (lbs/day)	2981	23534	929.4	25585.6
NOx (lbs/day)	710	4491	244	4957
PM10 (lbs/day)	121	933	37.6	1016.4
ROG (lbs/day)	284	2218	88	2414
SOx (lbs/day)	57	351	20.7	387.3

Cumulative Emissions=project+related–existing

CONSTRUCTION EMISSION CALCULATIONS

Harbor Gateway -- McDonnell Douglas

Construction Fuel Consumption & Combustion Embased on 260 workdays/yr=21.5 workdays/mo

	Number of Vehicles	Emission Factors (lbs/hour)* CO	ROC	NOx	SOx	PM10	
Scrapers	1	1.25	0.27	3.84	0.46	0.41	
Motor Graders	2	0.151	0.039	0.713	0.086	0.061	
Off-highway Trucks	2	1.8	0.19	4.17	0.45	0.26	
Track-type Tractors	1	0.35	0.12	1.26	0.14	0.112	
Wheel Loaders	2	0.572	0.23	1.9	0.182	0.17	
Backhoe Loaders	2	0.572	0.23	1.9	0.182	0.17	Wheel Loader
Hydraulic Excavator	1	0.572	0.23	1.9	0.182	0.17	Wheeled Backhoe
Bottom Dump Trucks	4	1.8	0.19	4.17	0.45	0.26	Off-highway truck
Water Wagons	1	1.8	0.19	4.17	0.45	0.26	Off-highway truck
Soil Compactors	1	0.3	0.065	0.87	0.067	0.05	

*SCAQMD Air Quality Handbook, 1993. Table A9-8-A

	Exhaust Emissions (lbs/8 hours/day) CO	ROC	NOx	SOx	PM10
Scrapers	10.0	2.2	30.7	3.7	3.3
Motor Graders	2.4	0.6	11.4	1.4	1.0
Off-highway Trucks	28.8	3.0	66.7	7.2	4.2
Track-type Tractors	2.8	1.0	10.1	1.1	0.9
Wheel Loaders	9.2	3.7	30.4	2.9	2.7
Backhoe Loaders	9.2	3.7	30.4	2.9	2.7
Hydraulic Excavator	4.6	1.8	15.2	1.5	1.4
Bottom Dump Trucks	57.6	6.1	133.4	14.4	8.3
Water Wagons	14.4	1.5	33.4	3.6	2.1
Soil Compactors	2.4	0.5	7.0	0.5	0.4
Daily Threshold	550.0	75.0	100.0	150.0	150.0
Daily Exhaust Total	**141.3**	**24.1**	**368.7**	**39.2**	**26.9**
Retail - Daily Total	**141.3**	**24.1**	**368.7**	**39.2**	**770.9**
Office/Ind - Daily Total	**141.3**	**24.1**	**368.7**	**39.2**	**102.9**
Quarterly Threshold (tons)	24.75	2.5	2.5	6.75	6.75
Quarterly Total Exhaust (tons)	**4.56**	**0.78**	**11.89**	**1.26**	**0.87**
Retail - Quarterly Total (tons)	**4.56**	**0.78**	**11.89**	**1.26**	**24.86**
Office/Ind - Quarterly Total (tons)	**4.56**	**0.78**	**11.89**	**1.26**	**3.32**
Number of Working Days/Month	**21.5**				

PM10

1.2 tons/acre/month of activity from EPA's AP42

50% Percent of PM10/TSP

	Acres/month
Retail	13.33
Office/Industrial	1.35

Emissions

Retail	8 tons/month
Office/Industrial	0.8125 tons/month
Retail	744 lbs/day
Office/Industrial	76 lbs/day
Retail	24 tons/quarter
Office/Industrial	2.4375 tons/quarter

18-Nov-96

Harbor Gateway – McDonnell Douglas

Construction Worker Trips

	Construction Worker Trips		
Total Trips	78		
Non–Work Trips	0%		
Work Trips	100%		
ADT Non–Work	0		
ADT Work	78		
Pass–by	0%		
Pass–by Non–work Trips	0		
ADT less Pass–by / Non–work	0		
Total Trips	78		
Non–Work Trips (miles/trip)	6.20		
Work Trips (miles/trip)	10.60		
Non–work trips (miles)	0		
Work Trips (miles)	827		
Total VMT	827		
Number of Daily Trips (ADT)			
Arrivals	39		
Departures	39		
Total	78		
Vehicle–Days	39		
Trip–ends	78		
Average Trip Length	10.6		
Vehicle Miles Traveled	827		
Emission Factors			
CO (gm/mile)	10.41		
NOx (gm/mile)	0.67		
PM10			
Exhaust (g/mile)	0.01		
Tire Wear (g/mile)	0.19		
ROG			
Exhaust (g/mile)	0.4		
Hot Soak (gm/trip–end)	0.3		
Diurnal (gm/veh–day)	0.49		
Resting losses (gm/veh–day)	0.19		
SOx (gm/mile)	0.08		
Emissions			
CO (lbs/day)	19		
NOx (lbs/day)	1		
PM10			
Exhaust (lbs/day)	0		
Tire Wear (lbs/day)	0		
ROG			
Exhaust (lbs/day)	1		
Hot Soak (lbs/day)	0		
Diurnal (lbs/day)	0		
Resting losses (lbs/day)	0		
SOx (lbs/day)	0	Quarterly Emissions	
Total Emissions		(lbs\quarter)	(tons\quarter)
CO (lbs/day)	19	1225.5	0.61275
NOx (lbs/day)	1	64.5	0.03225
PM10 (lbs/day)	0	0	0
ROG (lbs/day)	1	64.5	0.03225
SOx (lbs/day)	0	0	0

18–Nov–96

EMFAC7 OUTPUT

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: SUMMER % HOT STAB 0.0 % MCY 0.4

TABLE 1: ESTIMATED TRAVEL FRACTIONS

	LIGHT DUTY AUTOS			LIGHT DUTY TRUCKS			MED DUTY TRUCKS		URBAN BUS	HEAVY DUTY TRUCKS			MCY
	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	ALL
% VMT	0.24	99.68	0.08	0.00	99.91	0.09	0.02	99.98	100.00	13.72	86.28	100.00	100.00
% TRIP	0.24	99.68	0.08	0.00	99.91	0.09	0.02	99.98	100.00	13.72	86.28	100.00	100.00
% VEH	0.52	99.30	0.18	0.00	99.80	0.20	0.06	99.94	100.00	18.65	81.35	100.00	100.00

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: SUMMER % HOT STAB 0.0 % MCY 0.4

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: CARBON MONOXIDE IN GRAMS PER MILE

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	3.17	3.01	2.83	2.62	2.40	2.18	1.97	1.79	1.62	1.50	1.44	1.43
3	63.37	60.24	56.51	52.38	48.03	43.67	39.50	35.71	32.49	30.04	28.73	28.59
5	40.30	38.37	36.09	33.56	30.92	28.28	25.75	23.47	21.54	20.08	19.34	19.32
10	21.15	20.17	19.01	17.73	16.40	15.06	13.79	12.65	11.68	10.96	10.61	10.63
15	14.27	13.61	12.84	11.98	11.09	10.20	9.35	8.59	7.94	7.46	7.23	7.25
20	10.78	10.28	9.70	9.05	8.38	7.72	7.08	6.50	6.02	5.66	5.49	5.50
25	8.69	8.29	7.82	7.30	6.76	6.23	5.72	5.26	4.87	4.58	4.45	4.46
30	7.30	6.96	6.57	6.14	5.69	5.24	4.81	4.43	4.11	3.87	3.76	3.77
35	6.32	6.03	5.69	5.32	4.93	4.55	4.18	3.85	3.58	3.37	3.28	3.29
40	5.61	5.36	5.06	4.73	4.40	4.06	3.74	3.45	3.21	3.03	2.95	2.96
45	5.13	4.90	4.64	4.34	4.04	3.74	3.45	3.20	2.98	2.83	2.76	2.77
50	4.88	4.66	4.42	4.15	3.87	3.60	3.34	3.11	2.92	2.78	2.72	2.74
55	4.92	4.71	4.48	4.22	3.96	3.71	3.47	3.26	3.08	2.96	2.92	2.95
60	5.60	5.37	5.13	4.87	4.61	4.36	4.12	3.92	3.76	3.66	3.64	3.70
65	8.12	7.81	7.49	7.17	6.86	6.57	6.32	6.12	5.97	5.89	5.93	6.07

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: SUMMER % HOT STAB 0.0 % MCY 0.4

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: TOTAL ORGANIC GASES IN GRAMS PER MILE
(EXHAUST PLUS RUNNING EVAP.)

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.29	0.27	0.26	0.25	0.24	0.24	0.24	0.24	0.25	0.27	0.29	0.32
3	5.72	5.46	5.23	5.04	4.90	4.81	4.80	4.87	5.04	5.34	5.81	6.45
5	3.59	3.43	3.30	3.19	3.10	3.05	3.05	3.10	3.21	3.40	3.70	4.10
10	1.81	1.73	1.65	1.58	1.52	1.47	1.45	1.44	1.46	1.51	1.60	1.74
15	1.21	1.15	1.09	1.04	0.99	0.94	0.91	0.89	0.88	0.89	0.92	0.97
20	0.93	0.88	0.83	0.78	0.74	0.71	0.67	0.65	0.64	0.63	0.64	0.66
25	0.76	0.72	0.68	0.64	0.61	0.57	0.55	0.52	0.51	0.50	0.50	0.52
30	0.65	0.61	0.58	0.55	0.52	0.49	0.46	0.44	0.43	0.42	0.42	0.43
35	0.56	0.53	0.50	0.47	0.45	0.42	0.40	0.39	0.37	0.36	0.36	0.37
40	0.49	0.47	0.44	0.42	0.39	0.37	0.35	0.34	0.33	0.32	0.32	0.32
45	0.44	0.41	0.39	0.37	0.35	0.33	0.32	0.30	0.29	0.29	0.29	0.29
50	0.40	0.38	0.36	0.34	0.32	0.31	0.29	0.28	0.27	0.27	0.27	0.28
55	0.38	0.36	0.35	0.33	0.31	0.30	0.29	0.28	0.28	0.28	0.28	0.29
60	0.41	0.39	0.37	0.36	0.35	0.34	0.33	0.33	0.33	0.33	0.35	0.37
65	0.60	0.58	0.57	0.55	0.54	0.53	0.53	0.53	0.54	0.56	0.59	0.64

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: SUMMER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: REACTIVE ORGANIC GASES IN GRAMS PER MILE
(EXHAUST PLUS RUNNING EVAP.)

SPEED	TEMPERATURE IN DEGREES FAHRENHEIT											
MPH	30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.25	0.24	0.23	0.22	0.22	0.22	0.22	0.22	0.23	0.25	0.27	0.31
3	5.03	4.82	4.64	4.49	4.39	4.35	4.37	4.48	4.68	5.00	5.48	6.12
5	3.16	3.04	2.93	2.85	2.79	2.77	2.79	2.86	2.99	3.19	3.49	3.89
10	1.60	1.53	1.46	1.41	1.36	1.33	1.31	1.32	1.35	1.40	1.50	1.63
15	1.07	1.02	0.97	0.92	0.88	0.85	0.82	0.81	0.80	0.82	0.85	0.90
20	0.82	0.77	0.73	0.69	0.66	0.63	0.60	0.59	0.57	0.57	0.58	0.61
25	0.67	0.63	0.60	0.57	0.54	0.51	0.49	0.47	0.46	0.45	0.46	0.47
30	0.57	0.54	0.51	0.48	0.46	0.43	0.41	0.40	0.38	0.38	0.38	0.39
35	0.49	0.47	0.44	0.42	0.40	0.38	0.36	0.34	0.33	0.33	0.33	0.33
40	0.43	0.41	0.39	0.37	0.35	0.33	0.31	0.30	0.29	0.29	0.29	0.29
45	0.38	0.36	0.34	0.33	0.31	0.29	0.28	0.27	0.26	0.26	0.26	0.26
50	0.35	0.33	0.32	0.30	0.29	0.27	0.26	0.25	0.25	0.24	0.25	0.25
55	0.34	0.32	0.30	0.29	0.28	0.27	0.26	0.25	0.25	0.25	0.26	0.27
60	0.36	0.34	0.33	0.32	0.31	0.30	0.30	0.29	0.30	0.30	0.32	0.34
65	0.52	0.51	0.50	0.49	0.48	0.47	0.47	0.47	0.49	0.51	0.54	0.59

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: SUMMER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: OXIDES OF NITROGEN IN GRAMS PER MILE

SPEED	TEMPERATURE IN DEGREES FAHRENHEIT											
MPH	30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.27	0.27	0.26	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.19	0.19
3	5.39	5.35	5.24	5.09	4.89	4.68	4.46	4.24	4.05	3.91	3.82	3.80
5	3.73	3.70	3.63	3.53	3.40	3.26	3.12	2.98	2.86	2.77	2.71	2.70
10	2.34	2.31	2.27	2.21	2.14	2.06	1.98	1.90	1.83	1.78	1.75	1.75
15	1.77	1.75	1.72	1.68	1.63	1.57	1.51	1.45	1.41	1.37	1.35	1.35
20	1.45	1.44	1.41	1.38	1.34	1.29	1.25	1.20	1.16	1.14	1.12	1.12
25	1.26	1.25	1.23	1.20	1.16	1.12	1.09	1.05	1.02	0.99	0.98	0.99
30	1.15	1.14	1.12	1.09	1.06	1.03	1.00	0.96	0.94	0.91	0.91	0.91
35	1.11	1.10	1.08	1.05	1.02	0.99	0.96	0.93	0.91	0.88	0.88	0.88
40	1.12	1.11	1.09	1.07	1.04	1.01	0.97	0.94	0.92	0.90	0.89	0.90
45	1.19	1.18	1.16	1.13	1.10	1.06	1.03	1.00	0.98	0.96	0.95	0.95
50	1.31	1.30	1.27	1.24	1.21	1.17	1.14	1.10	1.08	1.05	1.05	1.05
55	1.49	1.47	1.44	1.41	1.37	1.33	1.29	1.26	1.22	1.20	1.19	1.20
60	1.73	1.71	1.68	1.64	1.59	1.55	1.50	1.46	1.43	1.40	1.39	1.40
65	2.05	2.02	1.99	1.94	1.89	1.84	1.79	1.74	1.70	1.67	1.66	1.66

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: SUMMER % HOT STAB 0.0 % MCY 0.4

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: EXHAUST PARTICULATES IN GRAMS PER MILE

SPEED MPH	30	35	40	45	50	55	60	65	70	75	80	85
	TEMPERATURE IN DEGREES FAHRENHEIT											
IDLE*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
20	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
30	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
35	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
40	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
55	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
60	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
65	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY SUMMER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: SUMMER % HOT STAB 0.0 % MCY 0.4

TABLE 5: TRIP END HOT SOAK EMISSION RATES (TOG OR ROG) IN GRAMS PER TRIP

TEMPERATURE IN DEGREES FAHRENHEIT

30	35	40	45	50	55	60	65	70	75	80	85
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28	0.29

TABLE 6: NON TRIP RELATED EMISSIONS

COMPOSITE MULTIDAY DIURNAL EMISSION RATE (TOG OR ROG): 0.46 GRAMS PER VEHICLE DAY

COMPOSITE SINGLE DAY DIURNAL EMISSION RATE (TOG OR ROG): 0.44 GRAMS PER HOUR

COMPOSITE MULTIDAY RESTING LOSS EMISSION RATE (TOG OR ROG): 0.18 GRAMS PER VEHICLE DAY

COMPOSITE SINGLE DAY RESTING LOSS EMISSION RATES (TOG OR ROG) IN GRAMS PER HOUR

TEMPERATURE IN DEGREES FAHRENHEIT

30	35	40	45	50	55	60	65	70	75	80	85
0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: WINTER	% HOT STAB 0.0		% MCY 0.4	

TABLE 1: ESTIMATED TRAVEL FRACTIONS

	LIGHT DUTY AUTOS			LIGHT DUTY TRUCKS			MED DUTY TRUCKS		URBAN BUS	HEAVY DUTY TRUCKS			MCY
	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	ALL
% VMT	0.24	99.68	0.08	0.00	99.91	0.09	0.02	99.98	100.00	13.72	86.28	100.00	100.00
% TRIP	0.24	99.68	0.08	0.00	99.91	0.09	0.02	99.98	100.00	13.72	86.28	100.00	100.00
% VEH	0.52	99.30	0.18	0.00	99.80	0.20	0.06	99.94	100.00	18.65	81.35	100.00	100.00

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: WINTER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: CARBON MONOXIDE IN GRAMS PER MILE

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	3.17	3.01	2.83	2.62	2.40	2.18	1.97	1.79	1.62	1.50	1.44	1.43
3	63.37	60.24	56.51	52.38	48.03	43.67	39.50	35.71	32.49	30.04	28.73	28.59
5	40.30	38.37	36.09	33.56	30.92	28.28	25.75	23.47	21.54	20.08	19.34	19.32
10	21.15	20.17	19.01	17.73	16.40	15.06	13.79	12.65	11.68	10.96	10.61	10.63
15	14.27	13.61	12.84	11.98	11.09	10.20	9.35	8.59	7.94	7.46	7.23	7.25
20	10.78	10.28	9.70	9.05	8.38	7.72	7.08	6.50	6.02	5.66	5.49	5.50
25	8.69	8.29	7.82	7.30	6.76	6.23	5.72	5.26	4.87	4.58	4.45	4.46
30	7.30	6.96	6.57	6.14	5.69	5.24	4.81	4.43	4.11	3.87	3.76	3.77
35	6.32	6.03	5.69	5.32	4.93	4.55	4.18	3.85	3.58	3.37	3.28	3.29
40	5.61	5.36	5.06	4.73	4.40	4.06	3.74	3.45	3.21	3.03	2.95	2.96
45	5.13	4.90	4.64	4.34	4.04	3.74	3.45	3.20	2.98	2.83	2.76	2.77
50	4.88	4.66	4.42	4.15	3.87	3.60	3.34	3.11	2.92	2.78	2.72	2.74
55	4.92	4.71	4.48	4.22	3.96	3.71	3.47	3.26	3.08	2.96	2.92	2.95
60	5.60	5.37	5.13	4.87	4.61	4.36	4.12	3.92	3.76	3.66	3.64	3.70
65	8.12	7.81	7.49	7.17	6.86	6.57	6.32	6.12	5.97	5.89	5.93	6.07

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: WINTER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: TOTAL ORGANIC GASES IN GRAMS PER MILE
(EXHAUST PLUS RUNNING EVAP.)

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.31	0.30	0.29	0.29	0.29	0.29	0.30	0.32	0.34	0.38	0.42	0.42
3	6.16	5.99	5.86	5.79	5.79	5.88	6.08	6.41	6.89	7.57	8.48	8.45
5	3.87	3.77	3.70	3.66	3.67	3.73	3.86	4.07	4.38	4.80	5.38	5.36
10	1.92	1.85	1.80	1.75	1.73	1.72	1.74	1.79	1.88	2.01	2.20	2.19
15	1.26	1.21	1.16	1.11	1.08	1.05	1.04	1.04	1.06	1.10	1.17	1.16
20	0.95	0.91	0.86	0.82	0.79	0.76	0.74	0.72	0.72	0.73	0.76	0.76
25	0.78	0.74	0.70	0.66	0.63	0.61	0.58	0.57	0.56	0.56	0.57	0.57
30	0.66	0.62	0.59	0.56	0.53	0.51	0.49	0.47	0.46	0.46	0.47	0.46
35	0.57	0.54	0.51	0.49	0.46	0.44	0.42	0.41	0.40	0.39	0.40	0.40
40	0.50	0.47	0.45	0.42	0.40	0.38	0.37	0.36	0.35	0.34	0.35	0.35
45	0.44	0.42	0.40	0.38	0.36	0.34	0.33	0.32	0.31	0.31	0.31	0.31
50	0.40	0.38	0.37	0.35	0.33	0.32	0.31	0.30	0.30	0.30	0.30	0.30
55	0.39	0.37	0.36	0.34	0.33	0.32	0.31	0.31	0.31	0.31	0.33	0.33
60	0.42	0.40	0.39	0.38	0.37	0.37	0.36	0.37	0.38	0.39	0.42	0.42
65	0.62	0.61	0.60	0.59	0.58	0.59	0.59	0.61	0.64	0.68	0.74	0.75

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

BOE-C6-0075723

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: WINTER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: REACTIVE ORGANIC GASES IN GRAMS PER MILE
(EXHAUST PLUS RUNNING EVAP.)

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.27	0.27	0.26	0.26	0.26	0.27	0.28	0.30	0.33	0.36	0.41	0.41
3	5.46	5.34	5.26	5.24	5.28	5.41	5.65	6.01	6.53	7.22	8.15	8.13
5	3.44	3.37	3.33	3.32	3.36	3.44	3.60	3.83	4.15	4.59	5.17	5.16
10	1.71	1.65	1.61	1.58	1.57	1.57	1.61	1.67	1.76	1.90	2.09	2.08
15	1.12	1.07	1.03	1.00	0.97	0.95	0.95	0.95	0.98	1.02	1.10	1.09
20	0.84	0.80	0.77	0.73	0.71	0.68	0.67	0.66	0.66	0.67	0.71	0.70
25	0.68	0.65	0.62	0.59	0.56	0.54	0.52	0.51	0.51	0.51	0.52	0.52
30	0.58	0.55	0.52	0.50	0.47	0.45	0.44	0.42	0.42	0.42	0.42	0.42
35	0.50	0.48	0.45	0.43	0.41	0.39	0.37	0.36	0.36	0.35	0.36	0.36
40	0.44	0.42	0.40	0.38	0.36	0.34	0.33	0.32	0.31	0.31	0.31	0.31
45	0.39	0.37	0.35	0.33	0.32	0.31	0.29	0.29	0.28	0.28	0.29	0.29
50	0.36	0.34	0.32	0.31	0.30	0.28	0.28	0.27	0.27	0.27	0.28	0.28
55	0.34	0.33	0.32	0.30	0.29	0.28	0.28	0.28	0.28	0.29	0.30	0.30
60	0.37	0.36	0.35	0.34	0.33	0.33	0.33	0.34	0.35	0.36	0.39	0.39
65	0.55	0.54	0.53	0.52	0.52	0.53	0.54	0.56	0.59	0.63	0.69	0.70

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1 CALTRANS DIVISION OF NEW TECHNOLOGY, MATERIALS AND RESEARCH RUN DATES: ENV028F1.1 4/23/96 EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94

TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10	% COLD STARTS 22.0	% LDA 69.0	% LDT 19.4	% MDT 6.4
INSPECTION & MAINTENANCE: YES	% HOT STARTS 78.0	% UBD 0.0	% HDG 1.2	% HDD 3.6
SEASON: WINTER	% HOT STAB 0.0		% MCY 0.4	

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: OXIDES OF NITROGEN IN GRAMS PER MILE

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.27	0.27	0.26	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.19	0.19
3	5.39	5.35	5.24	5.09	4.89	4.68	4.46	4.24	4.05	3.91	3.82	3.80
5	3.73	3.70	3.63	3.53	3.40	3.26	3.12	2.98	2.86	2.77	2.71	2.70
10	2.34	2.31	2.27	2.21	2.14	2.06	1.98	1.90	1.83	1.78	1.75	1.75
15	1.77	1.75	1.72	1.68	1.63	1.57	1.51	1.45	1.41	1.37	1.35	1.35
20	1.45	1.44	1.41	1.38	1.34	1.29	1.25	1.20	1.16	1.14	1.12	1.12
25	1.26	1.25	1.23	1.20	1.16	1.12	1.09	1.05	1.02	0.99	0.98	0.99
30	1.15	1.14	1.12	1.09	1.06	1.03	1.00	0.96	0.94	0.91	0.91	0.91
35	1.11	1.10	1.08	1.05	1.02	0.99	0.96	0.93	0.91	0.88	0.88	0.88
40	1.12	1.11	1.09	1.07	1.04	1.01	0.97	0.94	0.92	0.90	0.89	0.90
45	1.19	1.18	1.16	1.13	1.10	1.06	1.03	1.00	0.98	0.96	0.95	0.95
50	1.31	1.30	1.27	1.24	1.21	1.17	1.14	1.10	1.08	1.05	1.05	1.05
55	1.49	1.47	1.44	1.41	1.37	1.33	1.29	1.26	1.22	1.20	1.19	1.20
60	1.73	1.71	1.68	1.64	1.59	1.55	1.50	1.46	1.43	1.40	1.39	1.40
65	2.05	2.02	1.99	1.94	1.89	1.84	1.79	1.74	1.70	1.67	1.66	1.66

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94
TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: WINTER % HOT STAB 0.0 % MCY 0.4

TABLE 2: COMPOSITE EMISSION FACTORS

POLLUTANT NAME: EXHAUST PARTICULATES IN GRAMS PER MILE

SPEED MPH	TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
IDLE*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
20	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
30	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
35	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
40	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
55	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
60	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
65	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

*IDLE EMISSIONS IN GRAMS/MIN, DERIVED FROM 3 MPH RATES

1ENV028F1.1

CALTRANS DIVISION OF
NEW TECHNOLOGY, MATERIALS AND RESEARCH

RUN DATES: ENV028F1.1 4/23/96
EMFAC7F1.1 4/23/96

EMFAC7F1.1 RATES AS OF 1/25/94
TIME RATE ADJUSTMENT BAGS 1 & 3 HARBOR GATEWAY WINTER 2006

YEAR: 2006 DEWPOINT: 10 % COLD STARTS 22.0 % LDA 69.0 % LDT 19.4 % MDT 6.4
INSPECTION & MAINTENANCE: YES % HOT STARTS 78.0 % UBD 0.0 % HDG 1.2 % HDD 3.6
SEASON: WINTER % HOT STAB 0.0 % MCY 0.4

TABLE 5: TRIP END HOT SOAK EMISSION RATES (TOG OR ROG) IN GRAMS PER TRIP

TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.52	0.56	0.62

TABLE 6: NON TRIP RELATED EMISSIONS

COMPOSITE MULTIDAY DIURNAL EMISSION RATE (TOG OR ROG): 0.43 GRAMS PER VEHICLE DAY

COMPOSITE SINGLE DAY DIURNAL EMISSION RATE (TOG OR ROG): 0.44 GRAMS PER HOUR

COMPOSITE MULTIDAY RESTING LOSS EMISSION RATE (TOG OR ROG): 0.21 GRAMS PER VEHICLE DAY

COMPOSITE SINGLE DAY RESTING LOSS EMISSION RATES (TOG OR ROG) IN GRAMS PER HOUR

TEMPERATURE IN DEGREES FAHRENHEIT 30	35	40	45	50	55	60	65	70	75	80	85
0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08

CALINE4 OUTPUT

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: PM Windspeed 2.5 - NORMANDIE & 190TH NP
RUN: NOR190NP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U=	2.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	6 (F)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	5. DEGREES	TEMP=	15.5 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	438	7	138	7	AG	1020	4.2	.0	15.9
B. WT	138	7	0	7	AG	887	39.5	.0	10.0
C. WL	138	2	0	2	AG	133	39.5	.0	10.0
D. WD	0	7	-83	7	AG	1675	9.4	.0	15.9
E. WE	-83	7	-383	7	AG	1675	4.2	.0	15.9
F. NF	5	-445	5	-145	AG	1175	4.2	.0	12.6
G. NT	5	-145	5	0	AG	981	39.5	.0	10.0
H. NL	2	-145	2	0	AG	194	39.5	.0	10.0
I. ND	5	0	5	83	AG	1170	9.4	.0	12.6
J. NE	5	83	5	383	AG	1170	4.2	.0	12.6
K. EF	-495	-7	-195	-7	AG	1412	4.2	.0	15.9
L. ET	-195	-7	0	-7	AG	1226	39.5	.0	10.0
M. EL	-195	-2	0	-2	AG	186	39.5	.0	10.0
N. ED	0	-7	83	-7	AG	1192	9.4	.0	15.9
O. EE	83	-7	383	-7	AG	1192	4.2	.0	15.9
P. SF	-5	431	-5	131	AG	1335	4.2	.0	12.6
Q. ST	-5	131	-5	0	AG	1144	39.5	.0	10.0
R. SL	-2	131	-2	0	AG	191	39.5	.0	10.0
S. SD	-5	0	-5	-83	AG	905	9.4	.0	12.6
T. SE	-5	-83	-5	-383	AG	905	4.2	.0	12.6

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE	16	20	1.8
2. SE	16	-20	1.8
3. SW	-16	-20	1.8
4. NW	-16	20	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE	191.	2.0	.0	.4	.1	.0	.0	.0	1.1	.2
2. SE	281.	2.2	.0	.0	.0	.1	.1	.0	.5	.1
3. SW	11.	2.4	.0	.0	.0	.2	.0	.0	.0	.0
4. NW	102.	1.9	.0	.9	.1	.0	.0	.0	.0	.0

Columns A–H: CONC/LINK (PPM)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. NE	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	.0
2. SE	.0	.0	.0	1.2	.2	.0	.0	.0	.0	.0	.1	.0
3. SW	.1	.1	.0	.6	.1	.0	.0	.0	1.2	.2	.0	.0
4. NW	.1	.0	.0	.0	.0	.1	.1	.0	.6	.1	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:51:29

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: PM Windspeed 2.5 - NORMANDIE & 190TH WP
RUN: NOR190NP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U= 2.5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 6 (F)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.5 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	438	7	138	7	AG	1308	4.2	.0	15.9
B. WT	138	7	0	7	AG	934	39.5	.0	10.0
C. WL	138	2	0	2	AG	374	39.5	.0	10.0
D. WD	0	7	-83	7	AG	1799	9.4	.0	15.9
E. WE	-83	7	-383	7	AG	1799	4.2	.0	15.9
F. NF	5	-445	5	-145	AG	1215	4.2	.0	12.6
G. NT	5	-145	5	0	AG	1021	39.5	.0	10.0
H. NL	2	-145	2	0	AG	194	39.5	.0	10.0
I. ND	5	0	5	83	AG	1211	9.4	.0	12.6
J. NE	5	83	5	383	AG	1211	4.2	.0	12.6
K. EF	-495	-7	-195	-7	AG	1460	4.2	.0	15.9
L. ET	-195	-7	0	-7	AG	1271	39.5	.0	10.0
M. EL	-195	-2	0	-2	AG	189	39.5	.0	10.0
N. ED	0	-7	83	-7	AG	1216	9.4	.0	15.9
O. EE	83	-7	383	-7	AG	1216	4.2	.0	15.9
P. SF	-5	431	-5	131	AG	1572	4.2	.0	12.6
Q. ST	-5	131	-5	0	AG	1381	39.5	.0	10.0
R. SL	-2	131	-2	0	AG	191	39.5	.0	10.0
S. SD	-5	0	-5	-83	AG	1329	9.4	.0	12.6
T. SE	-5	-83	-5	-383	AG	1329	4.2	.0	12.6

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: PM Windspeed 2.5 - NORMANDIE & 190TH WP
RUN: NOR190NP (WORST CASE ANGLE)
POLLUTANT: co

III. RECEPTOR LOCATIONS

RECEPTOR	X (M)	Y (M)	Z (M)
1. NE	16	20	1.8
2. SE	16	-20	1.8
3. SW	-16	-20	1.8
4. NW	-16	20	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
			CONC/LINK (PPM)							
1. NE	191.	2.2	.0	.5	.2	.0	.0	.0	1.1	.2
2. SE	281.	2.3	.0	.0	.0	.1	.1	.0	.5	.1
3. SW	11.	2.7	.0	.0	.0	.2	.0	.0	.0	.0
4. NW	102.	2.3	.0	.9	.3	.0	.0	.0	.0	.0

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
	CONC/LINK (PPM)											
1. NE	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	.1
2. SE	.0	.0	.0	1.2	.2	.0	.0	.0	.0	.0	.1	.0
3. SW	.1	.1	.0	.6	.1	.0	.0	.0	1.4	.2	.0	.0
4. NW	.1	.0	.0	.0	.0	.1	.1	.0	.7	.1	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:51:41

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 -PROJ DRIVEWAY & 190TH NP
RUN: PRJ190NP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U=	2.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	6 (F)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	5. DEGREES	TEMP=	15.5 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	*	381	7	81	7	*	AG	1693	4.2	.0	15.9
B. WT	*	81	7	0	7	*	AG	1693	39.5	.0	10.0
C. WD	*	0	7	-83	7	*	AG	1725	9.4	.0	15.9
D. WE	*	-83	7	-383	7	*	AG	1725	4.2	.0	15.9
E. EF	*	-396	-7	-96	-7	*	AG	1102	4.2	.0	15.9
F. ET	*	-96	-7	0	-7	*	AG	1102	39.5	.0	10.0
G. ED	*	0	-7	83	-7	*	AG	1345	9.4	.0	15.9
H. EE	*	83	-7	383	-7	*	AG	1345	4.2	.0	15.9
I. SF	*	-5	403	-5	103	*	AG	275	4.2	.0	12.6
J. ST	*	-5	103	-5	0	*	AG	32	39.5	.0	10.0
K. SL	*	-2	103	-2	0	*	AG	243	39.5	.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. NE	*	8	20	1.8
2. SE	*	8	-20	1.8
3. SW	*	-8	-20	1.8
4. NW	*	-16	20	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: Windspeed 2.5 -PROJ DRIVEWAY & 190TH NP
RUN: PRJ190NP (WORST CASE ANGLE)
POLLUTANT: co

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	110.	1.5	.0	1.3	.0	.0	.0	.0	.1	.0
2. SE	286.	1.2	.0	.0	.1	.1	.0	1.0	.0	.0
3. SW	23.	1.1	.0	.5	.0	.0	.0	.5	.0	.0
4. NW	107.	1.7	.0	1.4	.0	.0	.0	.0	.1	.0

RECEPTOR	CONC/LINK (PPM) I	J	K
1. NE	.0	.0	.0
2. SE	.0	.0	.0
3. SW	.0	.0	.1
4. NW	.0	.0	.1

1

RUN ENDED ON 10-28-96 AT 14:51:08

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 - PRJ DRIVEWAY & 190TH WP
RUN: PRJ190WP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U=	2.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	6 (F)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	5. DEGREES	TEMP=	15.5 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	388	7	88	7	AG	1815	4.2	.0	15.9
B. WT	88	7	0	7	AG	1783	39.5	.0	10.0
C. WL	88	2	0	2	AG	32	39.5	.0	10.0
D. WD	0	7	-83	7	AG	1835	9.4	.0	15.9
E. WE	-83	7	-383	7	AG	1835	4.2	.0	15.9
F. NF	5	-374	5	-74	AG	31	4.2	.0	15.9
G. NT	5	-74	5	0	AG	31	39.5	.0	10.0
H. EF	-396	-7	-96	-7	AG	1124	4.2	.0	15.9
I. ET	-96	-7	0	-7	AG	1124	39.5	.0	10.0
J. ED	0	-7	83	-7	AG	1393	9.4	.0	15.9
K. EE	83	-7	383	-7	AG	1393	4.2	.0	15.9
L. SF	-5	403	-5	103	AG	317	4.2	.0	12.6
M. ST	-5	103	-5	0	AG	267	39.5	.0	10.0
N. SL	-2	103	-2	0	AG	50	39.5	.0	10.0
O. SD	-5	0	-5	-83	AG	59	9.4	.0	12.6
P. SE	-5	-83	-5	-383	AG	59	4.2	.0	12.6

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE	8	20	1.8
2. SE	18	-20	1.8
3. SW	-16	-20	1.8
4. NW	-16	20	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: Windspeed 2.5 - PRJ DRIVEWAY & 190TH WP
RUN: PRJ190WP (WORST CASE ANGLE)
POLLUTANT: co

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	108.	1.6	.0	1.4	.0	.0	.0	.0	.0	.0
2. SE	287.	1.3	.0	.0	.0	.2	.0	.0	.0	.0
3. SW	44.	1.4	.0	.7	.0	.0	.0	.0	.0	.0
4. NW	107.	1.9	.0	1.5	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P
1. NE	.0	.1	.1	.0	.0	.0	.0	.0
2. SE	1.0	.0	.0	.0	.0	.0	.0	.0
3. SW	.6	.1	.0	.0	.0	.0	.0	.0
4. NW	.0	.1	.0	.0	.1	.0	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:51:17

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 - WESTERN & 190TH NP
RUN: WES190NP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U= 2.5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 6 (F)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.5 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	431	7	131	7	AG	1533	4.2	.0	15.9
B. WT	131	7	0	7	AG	1056	39.5	.0	10.0
C. WL	131	2	0	2	AG	477	39.5	.0	10.0
D. WD	0	7	-83	7	AG	987	9.4	.0	15.9
E. WE	-83	7	-383	7	AG	987	4.2	.0	15.9
F. NF	5	-410	5	-110	AG	986	4.2	.0	12.6
G. NT	5	-110	5	0	AG	855	39.5	.0	10.0
H. NL	2	-110	2	0	AG	131	39.5	.0	10.0
I. ND	5	0	5	83	AG	1402	9.4	.0	12.6
J. NE	5	83	5	383	AG	1402	4.2	.0	12.6
K. EF	-452	-7	-152	-7	AG	1786	4.2	.0	15.9
L. ET	-152	-7	0	-7	AG	1597	39.5	.0	10.0
M. EL	-152	-2	0	-2	AG	189	39.5	.0	10.0
N. ED	0	-7	83	-7	AG	1823	9.4	.0	15.9
O. EE	83	-7	383	-7	AG	1823	4.2	.0	15.9
P. SF	-5	445	-5	145	AG	2004	4.2	.0	12.6
Q. ST	-5	145	-5	0	AG	1609	39.5	.0	10.0
R. SL	-2	145	-2	0	AG	395	39.5	.0	10.0
S. SD	-5	0	-5	-83	AG	2097	9.4	.0	12.6
T. SE	-5	-83	-5	-383	AG	2097	4.2	.0	12.6

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Windspeed 2.5 - WESTERN & 190TH NP
RUN: WES190NP (WORST CASE ANGLE)
POLLUTANT: co

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. NE	16	20	1.8
2. SE	16	-20	1.8
3. SW	-16	-20	1.8
4. NW	-16	20	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	193.	2.2	.0	.5	.2	.0	.0	.0	.9	.1
2. SE	282.	2.4	.0	.0	.0	.0	.1	.0	.4	.1
3. SW	11.	3.2	.0	.0	.0	.1	.0	.0	.0	.0
4. NW	105.	2.7	.0	1.0	.4	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. NE	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0	.2	.1
2. SE	.0	.0	.0	1.4	.2	.0	.0	.0	.0	.0	.2	.0
3. SW	.1	.1	.0	.8	.1	.0	.0	.0	1.6	.4	.0	.0
4. NW	.1	.0	.0	.0	.0	.1	.1	.0	.8	.2	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:50:50

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 - WESTERN & 190TH WP
RUN: WES190WP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U=	2.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	6 (F)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	5. DEGREES	TEMP=	15.5 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	431	7	131	7	AG	1567	4.2	.0	15.9
B. WT	131	7	0	7	AG	1090	39.5	.0	10.0
C. WL	131	2	0	2	AG	477	39.5	.0	10.0
D. WD	0	7	-83	7	AG	1002	9.4	.0	15.9
E. WE	-83	7	-383	7	AG	1002	4.2	.0	15.9
F. NF	5	-410	5	-110	AG	992	4.2	.0	12.6
G. NT	5	-110	5	0	AG	860	39.5	.0	10.0
H. NL	2	-110	2	0	AG	132	39.5	.0	10.0
I. ND	5	0	5	83	AG	1426	9.4	.0	12.6
J. NE	5	83	5	383	AG	1426	4.2	.0	12.6
K. EF	-452	-7	-152	-7	AG	2111	4.2	.0	15.9
L. ET	-152	-7	0	-7	AG	1922	39.5	.0	10.0
M. EL	-152	-2	0	-2	AG	189	39.5	.0	10.0
N. ED	0	-7	83	-7	AG	2219	9.4	.0	15.9
O. EE	83	-7	383	-7	AG	2219	4.2	.0	15.9
P. SF	-5	445	-5	145	AG	2162	4.2	.0	12.6
Q. ST	-5	145	-5	0	AG	1629	39.5	.0	10.0
R. SL	-2	145	-2	0	AG	533	39.5	.0	10.0
S. SD	-5	0	-5	-83	AG	2185	9.4	.0	12.6
T. SE	-5	-83	-5	-383	AG	2185	4.2	.0	12.6

JOB: Windspeed 2.5 - WESTERN & 190TH WP
RUN: WES190WP (WORST CASE ANGLE)
POLLUTANT: co

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. NE	16	20	1.8
2. SE	16	-20	1.8
3. SW	-16	-20	1.8
4. NW	-16	20	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	231.	2.5	.0	.4	.0	.1	.0	.0	.0	.0
2. SE	282.	2.7	.0	.0	.0	.0	.1	.0	.5	.1
3. SW	11.	3.5	.0	.0	.0	.1	.0	.0	.0	.0
4. NW	107.	2.8	.0	1.0	.4	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. NE	.2	.0	.0	.8	.1	.0	.0	.0	.6	.3	.1	.0
2. SE	.0	.0	.0	1.7	.2	.0	.0	.0	.0	.0	.2	.0
3. SW	.1	.1	.0	.9	.1	.0	.0	.0	1.7	.5	.0	.0
4. NW	.1	.0	.0	.0	.0	.2	.0	.0	.9	.3	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:51:02

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 - WESTERN & TORRANCE NP
RUN: WES190NP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U=	2.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	6 (F)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	5. DEGREES	TEMP=	15.5 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. WF	431	5	131	5	AG	1525	4.2	.0	12.6
B. WT	131	5	0	5	AG	1406	39.5	.0	10.0
C. WL	131	2	0	2	AG	119	39.5	.0	10.0
D. WD	0	5	-83	5	AG	1509	9.4	.0	12.6
E. WE	-83	5	-383	5	AG	1509	4.2	.0	12.6
F. NF	5	-438	5	-138	AG	1272	4.2	.0	12.6
G. NT	5	-138	5	0	AG	1206	39.5	.0	10.0
H. NL	2	-138	2	0	AG	66	39.5	.0	10.0
I. ND	5	0	5	83	AG	1407	9.4	.0	12.6
J. NE	5	83	5	383	AG	1407	4.2	.0	12.6
K. EF	-396	-5	-96	-5	AG	910	4.2	.0	12.6
L. ET	-96	-5	0	-5	AG	698	39.5	.0	10.0
M. EL	-96	-2	0	-2	AG	212	39.5	.0	10.0
N. ED	0	-5	83	-5	AG	773	9.4	.0	12.6
O. EE	83	-5	383	-5	AG	773	4.2	.0	12.6
P. SF	-5	410	-5	110	AG	709	4.2	.0	12.6
Q. ST	-5	110	-5	0	AG	660	39.5	.0	10.0
R. SL	-2	110	-2	0	AG	49	39.5	.0	10.0
S. SD	-5	0	-5	-83	AG	727	9.4	.0	12.6
T. SE	-5	-83	-5	-383	AG	727	4.2	.0	12.6

BOE-C6-0075739

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: Windspeed 2.5 - WESTERN & TORRANCE NP
RUN: WES190NP (WORST CASE ANGLE)
POLLUTANT: co

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. NE	16	16	1.8
2. SE	16	-16	1.8
3. SW	-16	-16	1.8
4. NW	-16	16	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	191.	2.3	.0	.7	.1	.0	.0	.0	1.3	.1
2. SE	284.	1.9	.0	.0	.0	.2	.0	.0	.6	.0
3. SW	59.	1.8	.0	.7	.1	.0	.0	.0	.4	.0
4. NW	101.	2.2	.0	1.5	.1	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. NE	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	.0
2. SE	.0	.0	.0	.7	.2	.0	.0	.0	.0	.0	.1	.0
3. SW	.0	.0	.0	.2	.0	.1	.0	.0	.0	.0	.1	.0
4. NW	.1	.0	.0	.0	.0	.1	.0	.0	.3	.0	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:50:26

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Windspeed 2.5 - WESTERN & TORRANCE WP
RUN: WES190WP (WORST CASE ANGLE)
POLLUTANT: co

I. SITE VARIABLES

U= 2.5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 6 (F)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.5 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
		LINK COORDINATES (M)									
A. WF	*	431	5	131	5	*	AG	1528	4.2	.0	12.6
B. WT	*	131	5	0	5	*	AG	1409	39.5	.0	10.0
C. WL	*	131	2	0	2	*	AG	119	39.5	.0	10.0
D. WD	*	0	5	-83	5	*	AG	1513	9.4	.0	12.6
E. WE	*	-83	5	-383	5	*	AG	1513	4.2	.0	12.6
F. NF	*	5	-438	5	-138	*	AG	1400	4.2	.0	12.6
G. NT	*	5	-138	5	0	*	AG	1334	39.5	.0	10.0
H. NL	*	2	-138	2	0	*	AG	66	39.5	.0	10.0
I. ND	*	5	0	5	83	*	AG	1594	9.4	.0	12.6
J. NE	*	5	83	5	383	*	AG	1594	4.2	.0	12.6
K. EF	*	-396	-5	-96	-5	*	AG	968	4.2	.0	12.6
L. ET	*	-96	-5	0	-5	*	AG	699	39.5	.0	10.0
M. EL	*	-96	-2	0	-2	*	AG	269	39.5	.0	10.0
N. ED	*	0	-5	83	-5	*	AG	774	9.4	.0	12.6
O. EE	*	83	-5	383	-5	*	AG	774	4.2	.0	12.6
P. SF	*	-5	410	-5	110	*	AG	718	4.2	.0	12.6
Q. ST	*	-5	110	-5	0	*	AG	669	39.5	.0	10.0
R. SL	*	-2	110	-2	0	*	AG	49	39.5	.0	10.0
S. SD	*	-5	0	-5	-83	*	AG	733	9.4	.0	12.6
T. SE	*	-5	-83	-5	-383	*	AG	733	4.2	.0	12.6

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: Windspeed 2.5 - WESTERN & TORRANCE WP
RUN: WES190WP (WORST CASE ANGLE)
POLLUTANT: co

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. NE	16	16	1.8
2. SE	16	-16	1.8
3. SW	-16	-16	1.8
4. NW	-16	16	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. NE	191.	2.5	.0	.7	.1	.0	.0	.0	1.4	.1
2. SE	284.	2.0	.0	.0	.0	.2	.0	.0	.7	.0
3. SW	58.	1.8	.0	.7	.1	.0	.0	.0	.5	.0
4. NW	101.	2.2	.0	1.5	.1	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. NE	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	.0
2. SE	.0	.0	.0	.7	.3	.0	.0	.0	.0	.0	.1	.0
3. SW	.0	.0	.0	.3	.0	.1	.0	.0	.0	.0	.1	.0
4. NW	.2	.0	.0	.0	.0	.1	.0	.0	.4	.0	.0	.0

1

RUN ENDED ON 10-28-96 AT 14:50:38

Appendix E
Noise Worksheets

Daytime Average Hourly Auto Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	2,175	3,441	3,695
190th w/o Western	2,534	3,189	3,294
190th e/o Normandie	2,000	2,429	2,630
Western s/o Del Amo	1,741	1,951	2,022
Torrance w/o Western	1,788	2,131	2,174
Normandie n/o 182nd	1,156	1,249	1,319
Torrance e/o Normandie	1,270	1,631	1,692
182nd w/o Western	752	984	1,006

Daytime Average Hourly Medium Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	93	146	157
190th w/o Western	108	136	140
190th e/o Normandie	85	103	112
Western s/o Del Amo	74	83	86
Torrance w/o Western	76	91	93
Normandie n/o 182nd	49	53	56
Torrance e/o Normandie	54	69	72
182nd w/o Western	32	42	43

Daytime Average Hourly Heavy Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	46	73	79
190th w/o Western	54	68	70
190th e/o Normandie	43	52	56
Western s/o Del Amo	37	42	43
Torrance w/o Western	38	45	46
Normandie n/o 182nd	25	27	28
Torrance e/o Normandie	27	35	36
182nd w/o Western	16	21	21

Evening Average Hourly Auto Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	1,420	2,246	2,412
190th w/o Western	1,654	2,081	2,150
190th e/o Normandie	1,305	1,585	1,717
Western s/o Del Amo	1,136	1,273	1,320
Torrance w/o Western	1,167	1,391	1,419
Normandie n/o 182nd	754	815	861
Torrance e/o Normandie	829	1,065	1,104
182nd w/o Western	491	642	657

Evening Average Hourly Medium Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	60	96	103
190th w/o Western	70	89	91
190th e/o Normandie	56	67	73
Western s/o Del Amo	48	54	56
Torrance w/o Western	50	59	60
Normandie n/o 182nd	32	35	37
Torrance e/o Normandie	35	45	47
182nd w/o Western	21	27	28

Evening Average Hourly Heavy Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	30	48	51
190th w/o Western	35	44	46
190th e/o Normandie	28	34	37
Western s/o Del Amo	24	27	28
Torrance w/o Western	25	30	30
Normandie n/o 182nd	16	17	18
Torrance e/o Normandie	18	23	23
182nd w/o Western	10	14	14

Nighttime Average Hourly Auto Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	359	567	609
190th w/o Western	418	526	543
190th e/o Normandie	330	400	434
Western s/o Del Amo	287	322	333
Torrance w/o Western	295	351	358
Normandie n/o 182nd	191	206	217
Torrance e/o Normandie	209	269	279
182nd w/o Western	124	162	166

Nighttime Average Hourly Medium Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	15	24	26
190th w/o Western	18	22	23
190th e/o Normandie	14	17	18
Western s/o Del Amo	12	14	14
Torrance w/o Western	13	15	15
Normandie n/o 182nd	8	9	9
Torrance e/o Normandie	9	11	12
182nd w/o Western	5	7	7

Nighttime Average Hourly Heavy Truck Volumes

	1996	2006 No Project	2006 + Project
190th e/o Western	8	12	13
190th w/o Western	9	11	12
190th e/o Normandie	7	9	9
Western s/o Del Amo	6	7	7
Torrance w/o Western	6	7	8
Normandie n/o 182nd	4	4	5
Torrance e/o Normandie	4	6	6
182nd w/o Western	3	3	4

BOE-C6-0075744

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 1996 Daytime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2175
2. Medium Truck Volume	93
3. Heavy Truck Volume	46
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

BOE-C6-0075745

Title: 190th Street east of Western - 1996 Daytime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.63
Leq Med. Trucks	64.22
Leq Heavy Trucks	65.68
ELEMENT TOTALS	71.91

BOE-C6-0075746

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 1996 Evening
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1420
2. Medium Truck Volume	60
3. Heavy Truck Volume	30
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: 190th Street east of Western - 1996 Evening
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.78
Leq Med. Trucks	62.32
Leq Heavy Trucks	63.83
ELEMENT TOTALS	70.05

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 1996 Nighttime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	359
2. Medium Truck Volume	15
3. Heavy Truck Volume	8
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 64 DBA (APPROX. L10 66 DBA)

Title: 190th Street east of Western - 1996 Nighttime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.81
Leq Med. Trucks	56.30
Leq Heavy Trucks	58.09
ELEMENT TOTALS	64.13

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	3441
2. Medium Truck Volume	146
3. Heavy Truck Volume	73
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 74 DBA (APPROX. L10 76 DBA)

Title: 190th Street east of Western - 2006 Baseline Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	71.63
Leq Med. Trucks	66.18
Leq Heavy Trucks	67.69
ELEMENT TOTALS	73.90

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2246
2. Medium Truck Volume	96
3. Heavy Truck Volume	48
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: 190th Street east of Western - 2006 Baseline Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.77
Leq Med. Trucks	64.36
Leq Heavy Trucks	65.87
ELEMENT TOTALS	72.06

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	567
2. Medium Truck Volume	24
3. Heavy Truck Volume	12
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 66 DBA (APPROX. L10 68 DBA)

Title: 190th Street east of Western - 2006 Baseline Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	63.79
Leq Med. Trucks	58.34
Leq Heavy Trucks	59.85
ELEMENT TOTALS	66.07

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	3695
2. Medium Truck Volume	157
3. Heavy Truck Volume	79
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 74 DBA (APPROX. L10 77 DBA)

Title: 190th Street east of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	71.93
Leq Med. Trucks	66.50
Leq Heavy Trucks	68.03
ELEMENT TOTALS	74.22

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2412
2. Medium Truck Volume	103
3. Heavy Truck Volume	51
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 72 DBA (APPROX. L10 75 DBA)

Title: 190th Street east of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	70.08
Leq Med. Trucks	64.67
Leq Heavy Trucks	66.13
ELEMENT TOTALS	72.36

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	609
2. Medium Truck Volume	26
3. Heavy Truck Volume	13
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 66 DBA (APPROX. L10 68 DBA)

Title: 190th Street east of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	64.10
Leq Med. Trucks	58.69
Leq Heavy Trucks	60.20
ELEMENT TOTALS	66.39

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 1996 Daytime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2534
2. Medium Truck Volume	108
3. Heavy Truck Volume	54
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 73 DBA (APPROX. L10 75 DBA)

Title: 190th Street west of Western - 1996 Daytime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	70.30
Leq Med. Trucks	64.87
Leq Heavy Trucks	66.38
ELEMENT TOTALS	72.58

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 1996 Evening
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1654
2. Medium Truck Volume	70
3. Heavy Truck Volume	35
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: 190th Street west of Western - 1996 Evening
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.44
Leq Med. Trucks	62.99
Leq Heavy Trucks	64.50
ELEMENT TOTALS	70.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 1996 Nighttime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	418
2. Medium Truck Volume	18
3. Heavy Truck Volume	9
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 65 DBA (APPROX. L10 66 DBA)

Title: 190th Street west of Western - 1996 Nighttime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	62.47
Leq Med. Trucks	57.09
Leq Heavy Trucks	58.60
ELEMENT TOTALS	64.77

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	3189
2. Medium Truck Volume	136
3. Heavy Truck Volume	68
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 74 DBA (APPROX. L10 76 DBA)

Title: 190th Street west of Western - 2006 Baseline Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	71.30
Leq Med. Trucks	65.87
Leq Heavy Trucks	67.38
ELEMENT TOTALS	73.58

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2081
2. Medium Truck Volume	89
3. Heavy Truck Volume	44
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: 190th Street west of Western - 2006 Baseline Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.44
Leq Med. Trucks	64.03
Leq Heavy Trucks	65.49
ELEMENT TOTALS	71.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	526
2. Medium Truck Volume	22
3. Heavy Truck Volume	11
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 66 DBA (APPROX. L10 67 DBA)

Title: 190th Street west of Western - 2006 Baseline Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	63.47
Leq Med. Trucks	57.96
Leq Heavy Trucks	59.47
ELEMENT TOTALS	65.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	3294
2. Medium Truck Volume	140
3. Heavy Truck Volume	70
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 74 DBA (APPROX. L10 76 DBA)

Title: 190th Street west of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	71.44
Leq Med. Trucks	66.00
Leq Heavy Trucks	67.51
ELEMENT TOTALS	73.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2150
2. Medium Truck Volume	91
3. Heavy Truck Volume	46
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: 190th Street west of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.58
Leq Med. Trucks	64.13
Leq Heavy Trucks	65.68
ELEMENT TOTALS	71.87

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street west of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	543
2. Medium Truck Volume	23
3. Heavy Truck Volume	12
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 66 DBA (APPROX. L10 68 DBA)

Title: 190th Street west of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	63.61
Leq Med. Trucks	58.15
Leq Heavy Trucks	59.85
ELEMENT TOTALS	65.93

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 1996 Daytime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2000
2. Medium Truck Volume	85
3. Heavy Truck Volume	43
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: 190th Street east of Normandie - 1996 Daytime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.27
Leq Med. Trucks	63.83
Leq Heavy Trucks	65.39
ELEMENT TOTALS	71.56

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 1996 Evening
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1305
2. Medium Truck Volume	56
3. Heavy Truck Volume	28
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: 190th Street east of Normandie - 1996 Evening
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.41
Leq Med. Trucks	62.02
Leq Heavy Trucks	63.53
ELEMENT TOTALS	69.71

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 1996 Nighttime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	330
2. Medium Truck Volume	14
3. Heavy Truck Volume	7
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 64 DBA (APPROX. L10 65 DBA)

Title: 190th Street east of Normandie - 1996 Nighttime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.44
Leq Med. Trucks	56.00
Leq Heavy Trucks	57.51
ELEMENT TOTALS	63.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 2006 Baseline Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2429
2. Medium Truck Volume	103
3. Heavy Truck Volume	52
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 72 DBA (APPROX. L10 75 DBA)

BOE-C6-0075787

Title: 190th Street east of Normandie - 2006 Baseline Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	70.11
Leq Med. Trucks	64.67
Leq Heavy Trucks	66.22
ELEMENT TOTALS	72.40

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 2006 Baseline Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1585
2. Medium Truck Volume	67
3. Heavy Truck Volume	34
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: 190th Street east of Normandie - 2006 Baseline Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.26
Leq Med. Trucks	62.80
Leq Heavy Trucks	64.37
ELEMENT TOTALS	70.55

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* * * * * *  LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5  February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108


Title: 190th Street east of Normandie - 2006 Baseline Nighttime
Date: 10-25-1996
                                  ELEMENT NUMBER
INPUT DATA ( Feet & MPH )         1
----------------------------------
 1. Auto Volume                 400
 2. Medium Truck Volume          17
 3. Heavy Truck Volume            9
 4. Vehicle Speed                45
 5. Dist. to CTR. Near Lane      50
 6. Roadway Angle, Left         -90
 7. Roadway Angle, Right         90
 8. Drop-Off Rate                 3
 9. Number of lanes               4
10. Grade Correction              0
11. Dist. to Shoulder/Cut         0
12. Height of Shoulder/Cut        0
13. Distance to Barrier           0
14. Barrier Type                  0
15. Height of Barrier             0
16. Barrier Angle, Left           0
17. Barrier Angle, Right          0
18. Height of Observer            0
----------------------------------

OUTPUT DATA  (Based on CALIFORNIA Ref. Energy Mean Emission Levels)
----------------------------------
NO BARRIER   TOTAL LEQ = 65 DBA  (APPROX. L10 66 DBA)

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BOE-C6-0075791

Title: 190th Street east of Normandie - 2006 Baseline Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	62.28
Leq Med. Trucks	56.84
Leq Heavy Trucks	58.60
ELEMENT TOTALS	64.62

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 2006 Baseline + Project Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2630
2. Medium Truck Volume	112
3. Heavy Truck Volume	56
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 73 DBA (APPROX. L10 75 DBA)

Title: 190th Street east of Normandie - 2006 Baseline + Project Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	70.46
Leq Med. Trucks	65.03
Leq Heavy Trucks	66.54
ELEMENT TOTALS	72.74

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 2006 Baseline + Project Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1717
2. Medium Truck Volume	73
3. Heavy Truck Volume	37
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: 190th Street east of Normandie - 2006 Baseline + Project Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.61
Leq Med. Trucks	63.17
Leq Heavy Trucks	64.74
ELEMENT TOTALS	70.90

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 190th Street east of Normandie - 2006 Baseline + Project Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	433
2. Medium Truck Volume	18
3. Heavy Truck Volume	9
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 65 DBA (APPROX. L10 66 DBA)

Title: 190th Street east of Normandie - 2006 Baseline + Project Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	62.62
Leq Med. Trucks	57.09
Leq Heavy Trucks	58.60
ELEMENT TOTALS	64.87

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Ave. south of Del Amo - 1996 Daytime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1741
2. Medium Truck Volume	74
3. Heavy Truck Volume	37
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: Western Ave. south of Del Amo - 1996 Daytime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.67
Leq Med. Trucks	63.23
Leq Heavy Trucks	64.74
ELEMENT TOTALS	70.95

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Ave. south of Del Amo - 1996 Evening
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1136
2. Medium Truck Volume	48
3. Heavy Truck Volume	24
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

Title: Western Ave. south of Del Amo - 1996 Evening
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.81
Leq Med. Trucks	61.35
Leq Heavy Trucks	62.86
ELEMENT TOTALS	69.08

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Ave. south of Del Amo - 1996 Nighttime
Date: 08-30-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	287
2. Medium Truck Volume	12
3. Heavy Truck Volume	6
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 63 DBA (APPROX. L10 65 DBA)

Title: Western Ave. south of Del Amo - 1996 Nighttime
Date: 08-30-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	60.84
Leq Med. Trucks	55.33
Leq Heavy Trucks	56.84
ELEMENT TOTALS	63.09

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1951
2. Medium Truck Volume	83
3. Heavy Truck Volume	42
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 74 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.16
Leq Med. Trucks	63.73
Leq Heavy Trucks	65.29
ELEMENT TOTALS	71.46

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1273
2. Medium Truck Volume	54
3. Heavy Truck Volume	27
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.31
Leq Med. Trucks	61.86
Leq Heavy Trucks	63.37
ELEMENT TOTALS	69.58

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	322
2. Medium Truck Volume	14
3. Heavy Truck Volume	7
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 64 DBA (APPROX. L10 65 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.34
Leq Med. Trucks	56.00
Leq Heavy Trucks	57.51
ELEMENT TOTALS	63.66

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2022
2. Medium Truck Volume	86
3. Heavy Truck Volume	43
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.32
Leq Med. Trucks	63.88
Leq Heavy Trucks	65.39
ELEMENT TOTALS	71.60

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1320
2. Medium Truck Volume	56
3. Heavy Truck Volume	28
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.46
Leq Med. Trucks	62.02
Leq Heavy Trucks	63.53
ELEMENT TOTALS	69.74

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	333
2. Medium Truck Volume	14
3. Heavy Truck Volume	7
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 64 DBA (APPROX. L10 65 DBA)

Title: Western Avenue south of Del Amo - 2006 Baseline + Project Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.48
Leq Med. Trucks	56.00
Leq Heavy Trucks	57.51
ELEMENT TOTALS	63.74

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 1996 Daytime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1788
2. Medium Truck Volume	76
3. Heavy Truck Volume	38
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

BOE-C6-0075817

Title: Torrance Blvd. west of Western - 1996 Daytime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.78
Leq Med. Trucks	63.35
Leq Heavy Trucks	64.85
ELEMENT TOTALS	71.06

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 1996 Evening
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1167
2. Medium Truck Volume	50
3. Heavy Truck Volume	25
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

Title: Torrance Blvd. west of Western - 1996 Evening
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.93
Leq Med. Trucks	61.53
Leq Heavy Trucks	63.04
ELEMENT TOTALS	69.22

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 1996 Nighttime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	295
2. Medium Truck Volume	13
3. Heavy Truck Volume	6
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 63 DBA (APPROX. L10 65 DBA)

Title: Torrance Blvd. west of Western - 1996 Nighttime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	60.96
Leq Med. Trucks	55.68
Leq Heavy Trucks	56.84
ELEMENT TOTALS	63.22

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* * * * * *  LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5  February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108


Title: Torrance Blvd. west of Western - 2006 Baseline Daytime
Date: 10-25-1996
                                 ELEMENT NUMBER
INPUT DATA ( Feet & MPH )        1
----------------------------------
 1. Auto Volume               2131
 2. Medium Truck Volume         91
 3. Heavy Truck Volume          45
 4. Vehicle Speed               45
 5. Dist. to CTR. Near Lane     50
 6. Roadway Angle, Left        -90
 7. Roadway Angle, Right        90
 8. Drop-Off Rate                3
 9. Number of lanes              4
10. Grade Correction             0
11. Dist. to Shoulder/Cut        0
12. Height of Shoulder/Cut       0
13. Distance to Barrier          0
14. Barrier Type                 0
15. Height of Barrier            0
16. Barrier Angle, Left          0
17. Barrier Angle, Right         0
18. Height of Observer           0
----------------------------------

OUTPUT DATA  (Based on CALIFORNIA Ref. Energy Mean Emission Levels)
----------------------------------
NO BARRIER   TOTAL LEQ = 72 DBA  (APPROX. L10 74 DBA)

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Title: Torrance Blvd. west of Western - 2006 Baseline Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.54
Leq Med. Trucks	64.13
Leq Heavy Trucks	65.59
ELEMENT TOTALS	71.82

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 2006 Baseline Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1391
2. Medium Truck Volume	59
3. Heavy Truck Volume	30
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Torrance Blvd. west of Western - 2006 Baseline Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.69
Leq Med. Trucks	62.25
Leq Heavy Trucks	63.83
ELEMENT TOTALS	69.99

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 2006 Baseline Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	351
2. Medium Truck Volume	15
3. Heavy Truck Volume	7
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 64 DBA   (APPROX. L10 66 DBA)

Title: Torrance Blvd. west of Western - 2006 Baseline Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.71
Leq Med. Trucks	56.30
Leq Heavy Trucks	57.51
ELEMENT TOTALS	63.93

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	2174
2. Medium Truck Volume	93
3. Heavy Truck Volume	46
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 72 DBA (APPROX. L10 74 DBA)

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Daytime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	69.63
Leq Med. Trucks	64.22
Leq Heavy Trucks	65.68
ELEMENT TOTALS	71.91

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1419
2. Medium Truck Volume	60
3. Heavy Truck Volume	30
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Evening
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.78
Leq Med. Trucks	62.32
Leq Heavy Trucks	63.83
ELEMENT TOTALS	70.05

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	358
2. Medium Truck Volume	15
3. Heavy Truck Volume	8
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 64 DBA (APPROX. L10 66 DBA)

Title: Torrance Blvd. west of Western - 2006 Baseline + Project Nighttime
Date: 10-25-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	61.80
Leq Med. Trucks	56.30
Leq Heavy Trucks	58.09
ELEMENT TOTALS	64.12

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd St. - 1996 Daytime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1156
2. Medium Truck Volume	49
3. Heavy Truck Volume	25
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

BOE-C6-0075835

Title: Normandie Ave. north of 182nd St. - 1996 Daytime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.89
Leq Med. Trucks	61.44
Leq Heavy Trucks	63.04
ELEMENT TOTALS	69.19

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd St. - 1996 Evening
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	754
2. Medium Truck Volume	32
3. Heavy Truck Volume	16
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 67 DBA (APPROX. L10 69 DBA)

Title: Normandie Ave. north of 182nd St. - 1996 Evening
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	65.03
Leq Med. Trucks	59.59
Leq Heavy Trucks	61.10
ELEMENT TOTALS	67.31

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd St. - 1996 Nighttime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	191
2. Medium Truck Volume	8
3. Heavy Truck Volume	4
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 61 DBA (APPROX. L10 63 DBA)

Title: Normandie Ave. north of 182nd St. - 1996 Nighttime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	59.07
Leq Med. Trucks	53.57
Leq Heavy Trucks	55.08
ELEMENT TOTALS	61.32

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1249
2. Medium Truck Volume	53
3. Heavy Truck Volume	27
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Daytime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.22
Leq Med. Trucks	61.78
Leq Heavy Trucks	63.37
ELEMENT TOTALS	69.52

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	815
2. Medium Truck Volume	35
3. Heavy Truck Volume	17
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 68 DBA (APPROX. L10 70 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	65.37
Leq Med. Trucks	59.98
Leq Heavy Trucks	61.36
ELEMENT TOTALS	67.64

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	206
2. Medium Truck Volume	9
3. Heavy Truck Volume	4
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 62 DBA (APPROX. L10 63 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline Nighttime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	59.40
Leq Med. Trucks	54.08
Leq Heavy Trucks	55.08
ELEMENT TOTALS	61.61

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1319
2. Medium Truck Volume	56
3. Heavy Truck Volume	28
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Daytime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.46
Leq Med. Trucks	62.02
Leq Heavy Trucks	63.53
ELEMENT TOTALS	69.74

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	861
2. Medium Truck Volume	37
3. Heavy Truck Volume	18
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 68 DBA (APPROX. L10 70 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	65.61
Leq Med. Trucks	60.22
Leq Heavy Trucks	61.61
ELEMENT TOTALS	67.88

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	217
2. Medium Truck Volume	9
3. Heavy Truck Volume	5
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 62 DBA (APPROX. L10 63 DBA)

Title: Normandie Ave. north of 182nd Street - 2006 Baseline + Project Nighttime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	59.62
Leq Med. Trucks	54.08
Leq Heavy Trucks	56.05
ELEMENT TOTALS	61.97

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. east of Normandie - 1996 Daytime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1270
2. Medium Truck Volume	54
3. Heavy Truck Volume	27
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 70 DBA (APPROX. L10 72 DBA)

Title: Torrance Blvd. east of Normandie - 1996 Daytime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	67.30
Leq Med. Trucks	61.86
Leq Heavy Trucks	63.37
ELEMENT TOTALS	69.58

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Blvd. east of Normandie - 1996 Evening
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	829
2. Medium Truck Volume	35
3. Heavy Truck Volume	18
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 68 DBA (APPROX. L10 70 DBA)

BOE-C6-0075855

Title: Torrance Blvd. east of Normandie - 1996 Evening
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	65.44
Leq Med. Trucks	59.98
Leq Heavy Trucks	61.61
ELEMENT TOTALS	67.74

```
               * * * * * *  LEQV2 * * * * * *

           San Fransisco Highway Traffic Noise
                    Prediction Program
             Model Version 2.5  February 1985
            (Calif. Vehicle Emissions Added)

                  Based on FHWA-RD-77-108

Title: Torrance Blvd. east of Normandie - 1996 Nighttime
Date: 09-03-1996
                                  ELEMENT NUMBER
INPUT DATA ( Feet & MPH )           1
----------------------------------
 1. Auto Volume                   209
 2. Medium Truck Volume             9
 3. Heavy Truck Volume              4
 4. Vehicle Speed                  45
 5. Dist. to CTR. Near Lane        50
 6. Roadway Angle, Left           -90
 7. Roadway Angle, Right           90
 8. Drop-Off Rate                   3
 9. Number of lanes                 4
10. Grade Correction                0
11. Dist. to Shoulder/Cut           0
12. Height of Shoulder/Cut          0
13. Distance to Barrier             0
14. Barrier Type                    0
15. Height of Barrier               0
16. Barrier Angle, Left             0
17. Barrier Angle, Right            0
18. Height of Observer              0
----------------------------------

OUTPUT DATA  (Based on CALIFORNIA Ref. Energy Mean Emission Levels)
----------------------------------
NO BARRIER   TOTAL LEQ = 62 DBA  (APPROX. L10 63 DBA)

----------------------------------
```

Title: Torrance Blvd. east of Normandie - 1996 Nighttime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	59.46
Leq Med. Trucks	54.08
Leq Heavy Trucks	55.08
ELEMENT TOTALS	61.65

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1631
2. Medium Truck Volume	69
3. Heavy Truck Volume	35
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: Torrance Boulevard east of Normandie - 2006 Baseline Daytime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	68.38
Leq Med. Trucks	62.93
Leq Heavy Trucks	64.50
ELEMENT TOTALS	70.67

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1065
2. Medium Truck Volume	45
3. Heavy Truck Volume	23
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

Title: Torrance Boulevard east of Normandie - 2006 Baseline Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.53
Leq Med. Trucks	61.07
Leq Heavy Trucks	62.67
ELEMENT TOTALS	68.83

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	269
2. Medium Truck Volume	11
3. Heavy Truck Volume	6
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 63 DBA (APPROX. L10 64 DBA)

BOE-C6-0075863

```
Title: Torrance Boulevard east of Normandie - 2006 Baseline Nighttime
Date: 10-28-1996
                                  ELEMENT NUMBER
OUTPUT DATA (HOURLY LEQS)         1
----------------------------------

NO BARRIER

       Leq Auto               60.56
       Leq Med. Trucks        54.95
       Leq Heavy Trucks       56.84

       ELEMENT TOTALS         62.86
----------------------------------
```

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1692
2. Medium Truck Volume	72
3. Heavy Truck Volume	36
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 71 DBA (APPROX. L10 73 DBA)

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Daytime
Date: 10-28-1996

```
                                   ELEMENT NUMBER
OUTPUT DATA (HOURLY LEQS)          1
----------------------------------

NO BARRIER

       Leq Auto                68.54
       Leq Med. Trucks         63.11
       Leq Heavy Trucks        64.62

       ELEMENT TOTALS          70.83
----------------------------------
```

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1104
2. Medium Truck Volume	47
3. Heavy Truck Volume	23
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.69
Leq Med. Trucks	61.26
Leq Heavy Trucks	62.67
ELEMENT TOTALS	68.95

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	279
2. Medium Truck Volume	12
3. Heavy Truck Volume	6
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 63 DBA (APPROX. L10 65 DBA)

Title: Torrance Boulevard east of Normandie - 2006 Baseline + Project Nighttime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	60.71
Leq Med. Trucks	55.33
Leq Heavy Trucks	56.84
ELEMENT TOTALS	63.02

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 1996 Daytime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	752
2. Medium Truck Volume	32
3. Heavy Truck Volume	16
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 67 DBA   (APPROX. L10 69 DBA)

BOE-C6-0075871

Title: 182nd Street west of Western - 1996 Daytime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	65.02
Leq Med. Trucks	59.59
Leq Heavy Trucks	61.10
ELEMENT TOTALS	67.30

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 1996 Evening
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	491
2. Medium Truck Volume	21
3. Heavy Truck Volume	10
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER   TOTAL LEQ = 65 DBA   (APPROX. L10 67 DBA)

Title: 182nd Street west of Western - 1996 Evening
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	63.17
Leq Med. Trucks	57.76
Leq Heavy Trucks	59.06
ELEMENT TOTALS	65.41

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 1996 Nighttime
Date: 09-03-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	124
2. Medium Truck Volume	5
3. Heavy Truck Volume	3
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 60 DBA (APPROX. L10 61 DBA)

Title: 182nd Street west of Western - 1996 Nighttime
Date: 09-03-1996

OUTPUT DATA (HOURLY LEQS) — ELEMENT NUMBER 1

	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	57.19
Leq Med. Trucks	51.53
Leq Heavy Trucks	53.83
ELEMENT TOTALS	59.58

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	984
2. Medium Truck Volume	42
3. Heavy Truck Volume	21
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 68 DBA (APPROX. L10 70 DBA)

Title: 182nd Street west of Western - 2006 Baseline Daytime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.19
Leq Med. Trucks	60.77
Leq Heavy Trucks	62.28
ELEMENT TOTALS	68.48

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	642
2. Medium Truck Volume	27
3. Heavy Truck Volume	14
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 67 DBA (APPROX. L10 68 DBA)

Title: 182nd Street west of Western - 2006 Baseline Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	64.33
Leq Med. Trucks	58.85
Leq Heavy Trucks	60.52
ELEMENT TOTALS	66.63

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	162
2. Medium Truck Volume	7
3. Heavy Truck Volume	3
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 61 DBA (APPROX. L10 62 DBA)

Title: 182nd Street west of Western - 2006 Baseline Nighttime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	58.35
Leq Med. Trucks	52.99
Leq Heavy Trucks	53.83
ELEMENT TOTALS	60.51

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline + Project Daytime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	1006
2. Medium Truck Volume	43
3. Heavy Truck Volume	21
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 69 DBA (APPROX. L10 71 DBA)

Title: 182nd Street west of Western - 2006 Baseline + Project Daytime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	66.28
Leq Med. Trucks	60.87
Leq Heavy Trucks	62.28
ELEMENT TOTALS	68.55

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline + Project Evening
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	657
2. Medium Truck Volume	28
3. Heavy Truck Volume	14
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 67 DBA (APPROX. L10 68 DBA)

Title: 182nd Street west of Western - 2006 Baseline + Project Evening
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	64.43
Leq Med. Trucks	59.01
Leq Heavy Trucks	60.52
ELEMENT TOTALS	66.72

* * * * * * LEQV2 * * * * * *

San Fransisco Highway Traffic Noise
Prediction Program
Model Version 2.5 February 1985
(Calif. Vehicle Emissions Added)

Based on FHWA-RD-77-108

Title: 182nd Street west of Western - 2006 Baseline + Project Nighttime
Date: 10-28-1996

INPUT DATA (Feet & MPH)	ELEMENT NUMBER 1
1. Auto Volume	166
2. Medium Truck Volume	7
3. Heavy Truck Volume	4
4. Vehicle Speed	45
5. Dist. to CTR. Near Lane	50
6. Roadway Angle, Left	-90
7. Roadway Angle, Right	90
8. Drop-Off Rate	3
9. Number of lanes	4
10. Grade Correction	0
11. Dist. to Shoulder/Cut	0
12. Height of Shoulder/Cut	0
13. Distance to Barrier	0
14. Barrier Type	0
15. Height of Barrier	0
16. Barrier Angle, Left	0
17. Barrier Angle, Right	0
18. Height of Observer	0

OUTPUT DATA (Based on CALIFORNIA Ref. Energy Mean Emission Levels)

NO BARRIER TOTAL LEQ = 61 DBA (APPROX. L10 62 DBA)

Title: 182nd Street west of Western - 2006 Baseline + Project Nighttime
Date: 10-28-1996

OUTPUT DATA (HOURLY LEQS)	ELEMENT NUMBER 1
NO BARRIER	
Leq Auto	58.46
Leq Med. Trucks	52.99
Leq Heavy Trucks	55.08
ELEMENT TOTALS	60.87

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th St. east of Western - 1996
(50 feet from roadway edge)

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Daytime Leq	71.9
Evening Leq	70.1
Nighttime Leq	64.1
Ldn	72.9
CNEL	73.3
Ldn (variable hours)	72.9
CNEL (variable hrs)	73.3

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street east of Western - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	73.9	Daytime Hours (CNEL)	12
Evening Leq	72.1	Evening Hours	3
Nighttime Leq	66.1	Nighttime Hours	9
Ldn	74.9		
CNEL	75.3		
Ldn (variable hours)	74.9		
CNEL (variable hrs)	75.3		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street east of Western - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	74.2	Daytime Hours (CNEL)	12
Evening Leq	72.4	Evening Hours	3
Nighttime Leq	66.4	Nighttime Hours	9
Ldn	75.2		
CNEL	75.6		
Ldn (variable hours)	75.2		
CNEL (variable hrs)	75.6		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th St. west of Western - 1996
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	72.6	Daytime Hours (CNEL)	12
Evening Leq	70.7	Evening Hours	3
Nighttime Leq	64.8	Nighttime Hours	9
Ldn	73.6		
CNEL	74.0		
Ldn (variable hours)	73.6		
CNEL (variable hrs)	74.0		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street west of Western - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	73.6	Daytime Hours (CNEL)	12
Evening Leq	71.7	Evening Hours	3
Nighttime Leq	65.7	Nighttime Hours	9
Ldn	74.5		
CNEL	74.9		
Ldn (variable hours)	74.5		
CNEL (variable hrs)	74.9		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street west of Western - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	73.7	Daytime Hours (CNEL)	12
Evening Leq	71.9	Evening Hours	3
Nighttime Leq	65.9	Nighttime Hours	9
Ldn	74.7		
CNEL	75.1		
Ldn (variable hours)	74.7		
CNEL (variable hrs)	75.1		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th St. east of Normandie - 1996
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.6	Daytime Hours (CNEL)	12
Evening Leq	69.7	Evening Hours	3
Nighttime Leq	63.7	Nighttime Hours	9
Ldn	72.5		
CNEL	72.9		
Ldn (variable hours)	72.5		
CNEL (variable hrs)	72.9		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street east of Normandie - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	72.4	Daytime Hours (CNEL)	12
Evening Leq	70.6	Evening Hours	3
Nighttime Leq	64.6	Nighttime Hours	9

Ldn	73.4
CNEL	73.8

Ldn (variable hours)	73.4
CNEL (variable hrs)	73.8

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

190th Street east of Normandie - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	72.7	Daytime Hours (CNEL)	12
Evening Leq	70.9	Evening Hours	3
Nighttime Leq	64.9	Nighttime Hours	9
Ldn	73.7		
CNEL	74.1		
Ldn (variable hours)	73.7		
CNEL (variable hrs)	74.1		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Western Ave. south of Del Amo - 1996 Daytime
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.0	Daytime Hours (CNEL)	12
Evening Leq	69.1	Evening Hours	3
Nighttime Leq	63.1	Nighttime Hours	9

Ldn	71.9
CNEL	72.3

Ldn (variable hours)	71.9
CNEL (variable hrs)	72.3

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Western Avenue south of Del Amo - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.5	Daytime Hours (CNEL)	12
Evening Leq	69.6	Evening Hours	3
Nighttime Leq	63.7	Nighttime Hours	9
Ldn	72.5		
CNEL	72.9		
Ldn (variable hours)	72.5		
CNEL (variable hrs)	72.9		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Western Avenue south of Del Amo - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.6	Daytime Hours (CNEL)	12
Evening Leq	69.7	Evening Hours	3
Nighttime Leq	63.7	Nighttime Hours	9

Ldn	72.5
CNEL	72.9

Ldn (variable hours)	72.5
CNEL (variable hrs)	72.9

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. west of Western - 1996
(50 feet from roadway edge)

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Daytime Leq	71.1
Evening Leq	69.2
Nighttime Leq	63.2
Ldn	72.0
CNEL	72.4
Ldn (variable hours)	72.0
CNEL (variable hrs)	72.4

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. west of Western - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.8	Daytime Hours (CNEL)	12
Evening Leq	70.0	Evening Hours	3
Nighttime Leq	63.9	Nighttime Hours	9
Ldn	72.7		
CNEL	73.2		
Ldn (variable hours)	72.7		
CNEL (variable hrs)	73.2		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. west of Western - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	71.9	Daytime Hours (CNEL)	12
Evening Leq	70.1	Evening Hours	3
Nighttime Leq	64.1	Nighttime Hours	9

Ldn	72.9
CNEL	73.3

Ldn (variable hours)	72.9
CNEL (variable hrs)	73.3

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Normandie Ave. north of 182nd St. - 1996
(50 feet from roadway edge)

Daytime Leq	69.2
Evening Leq	67.3
Nighttime Leq	61.3
Ldn	70.1
CNEL	70.5
Ldn (variable hours)	70.1
CNEL (variable hrs)	70.5

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Normandie Ave. north of 182nd St. - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	69.5	Daytime Hours (CNEL)	12
Evening Leq	67.6	Evening Hours	3
Nighttime Leq	61.6	Nighttime Hours	9

Ldn	70.4
CNEL	70.8

Ldn (variable hours)	70.4
CNEL (variable hrs)	70.8

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Normandie Ave. north of 182nd St. - 2006 Baseline + Project
(50 feet from roadway edge)

Daytime Leq	69.7
Evening Leq	67.9
Nighttime Leq	62.0
Ldn	70.7
CNEL	71.2
Ldn (variable hours)	70.7
CNEL (variable hrs)	71.2

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. east of Normandie - 1996
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	69.6	Daytime Hours (CNEL)	12
Evening Leq	67.7	Evening Hours	3
Nighttime Leq	61.7	Nighttime Hours	9

Ldn	70.5
CNEL	70.9

Ldn (variable hours)	70.5
CNEL (variable hrs)	70.9

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. east of Normandie - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	70.7	Daytime Hours (CNEL)	12
Evening Leq	68.8	Evening Hours	3
Nighttime Leq	62.9	Nighttime Hours	9

Ldn	71.7
CNEL	72.1

Ldn (variable hours)	71.7
CNEL (variable hrs)	72.1

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

Torrance Blvd. east of Normandie - 2006 Baseline + Project
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	70.8	Daytime Hours (CNEL)	12
Evening Leq	69.0	Evening Hours	3
Nighttime Leq	63.0	Nighttime Hours	9
Ldn	71.8		
CNEL	72.2		
Ldn (variable hours)	71.8		
CNEL (variable hrs)	72.2		

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

182nd Street west of Western - 1996
(50 feet from roadway edge)

Daytime Leq	67.3
Evening Leq	65.4
Nighttime Leq	59.6
Ldn	68.3
CNEL	68.7
Ldn (variable hours)	68.3
CNEL (variable hrs)	68.7

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

182nd Street west of Western - 2006 Baseline
(50 feet from roadway edge)

		Daytime Hours (Ldn)	15
Daytime Leq	68.5	Daytime Hours (CNEL)	12
Evening Leq	66.6	Evening Hours	3
Nighttime Leq	60.5	Nighttime Hours	9

Ldn	69.4
CNEL	69.8

Ldn (variable hours)	69.4
CNEL (variable hrs)	69.8

Ldn and CNEL Calculations
(based upon Leq's from Caltrans' LeqV2 Model)

182nd Street west of Western - 2006 Baseline + Project
(50 feet from roadway edge)

Daytime Hours (Ldn)	15
Daytime Hours (CNEL)	12
Evening Hours	3
Nighttime Hours	9

Daytime Leq	68.6
Evening Leq	66.7
Nighttime Leq	60.9
Ldn	69.6
CNEL	70.0
Ldn (variable hours)	69.6
CNEL (variable hrs)	70.0

NOISE BARRIER CALCULATION*
8-FOOT WALL NOISE ATTENUATION POTENTIAL - GROUND FLOOR

DATA	INPUT
Elevation of barrier top, feet:	8
Elevation at source, feet:	0
Height of source above elevation, feet:	3
Elevation (ground or floor) at observer:	0
Distance from source to barrier, feet:	50
Distance from barrier to observer, feet:	20

RESULT	
Barrier Height =	3.6
Distance R =	50
Distance D =	20
Smaller of D/R or R/D =	0.40

Barrier Effect:	-8.7 dBA
Ground-level Observer?:	yes
Adjustment for loss of Ground Atten.:	0.0 dBA
Actual Barrier Attenuation:	-8.7 dBA
Finite Barrier Adjustment	
Enter angle subtended by barrier :	180 degrees

Appendix F
Traffic Analysis

DRAFT

TRAFFIC ANALYSIS FOR THE HARBOR GATEWAY CENTER MASTER PLAN MULTI-USE COMMUNITY

Prepared for:

MCDONNELL DOUGLAS REALTY COMPANY

Prepared by:

Crain & Associates
2007 Sawtelle Boulevard, Suite 4
Los Angeles, California 90025
(310) 473-6508

October 1996

EXECUTIVE SUMMARY

The project under consideration is the development of a 450,000 square foot shopping center and a 2,517,700 square foot industrial/office park. The shopping center could contain up to 4,000 theater seats and 30,000 square feet of restaurant uses. The project site is currently occupied by a 2,419,000 square foot distribution/warehouse facility used by McDonnell Douglas Aircraft Company. Previously, the site buildings had been used for aircraft manufacturing and assembly, with a total of approximately 5,500 persons working at the site. Following project completion, the site trip generation would be approximately 29,900 daily trips with 2,496 trips occurring during the morning peak hour and 2,907 trips occurring during the afternoon peak hour. The current site uses have a potential generation of approximately 8,560 daily trips, 845 morning peak hour trips and 1,105 evening peak hour trips.

The 170.2-acre project site is located within the Harbor Gateway section of Los Angeles. The site is bounded by 190th Street on the north, the Southern Pacific Railroad tracks paralleling Normandie Avenue on the east, industrial and residential uses on the south, and Western Avenue and industrial/vacant properties on the west. Access to the shopping center would be provided via driveways along 190th Street, a driveway from Normandie Avenue which crosses the railroad tracks and internal roadways which will extend along the western edge of the site and to Normandie Avenue south of the retail site. Access to the industrial/office park would be provided by the internal roadway network, which will extend across the site and intersect with 190th Street, Normandie Avenue and Western Avenue.

This traffic study analyzes existing and future morning and afternoon peak hour traffic conditions within the area that is expected to be directly impacted by the proposed development. This traffic study also identifies the potential cumulative traffic volume created by future related projects within the study area. Trips resulting from these related projects, as well as from the general, region-wide growth projected by SCAG, and the land-use intensifications within the City of Los Angeles projected by the City, were taken into account in the projection of future traffic conditions for Year 2006 for both with and without project scenarios.

Of the forty-one intersections analyzed in this study, thirty of the study intersections could be significantly impacted by traffic generated by the proposed project in one or both of the morning and evening traffic hours, prior to mitigation.

In order to minimize the traffic impacts of the project, a series of traffic reduction measures and roadway improvement measures was developed. All measures are considered feasible in that each is achievable within either existing public rights-of-way or the project site. The following measures are recommended to mitigate the project's significant traffic impacts to the degree feasible:

- o Compliance with Ordinance No. 168,700 (Transportation Demand Management and Trip Reduction Measures). This ordinance focuses on incorporating TDM facilities into the design of new buildings to promote alternative modes of transportation (see Appendix B). It should be followed in the design and construction of the project site and buildings.

- o Compliance with SCAQMD Rule 2202. The South Coast Air Quality Management District (SCAQMD) has adopted a rule designed to reduce the air pollution impacts of commute trips. This rule, unlike the rule it replaces, does not mandate trip reduction programs but allows individual employers to select from a variety of options. However, most employers have continued to select ridesharing programs as the most cost-effective method of reducing air quality impacts. If site employers implement these trip reduction measures, 15 percent or more of the peak hour traffic generation from the industrial/office park component of the project could be eliminated.

- Bus Transit Improvements. This project should work with the appropriate transit districts (i.e., Gardena Transit, Torrance Transit and MTA) to improve transit service to the site. Further, the sidewalks through the sites should be designed to provide attractive pedestrian routes to and from transit stops.

- 1. Hawthorne Boulevard and 190th Street -- Restripe 190th Street and restrict parking to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes. Modify the signal to remove the existing eastbound right-turn phase.

- 4. Crenshaw Boulevard and 190th Street -- Remove median islands, restripe and restrict parking along 190th Street to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes.

- 5. Crenshaw Boulevard and Del Amo Boulevard -- Restripe Del Amo Boulevard and modify the traffic signal to provide two left-turn-only lanes, a through/left optional lane and a right-turn-only lane in the westbound direction.

- 7. Western Avenue and Artesia Boulevard -- Restripe Western Avenue and restrict parking to convert the existing northbound and southbound right-turn-only lanes to through/right optional lanes.

- 9. Western Avenue and I-405 Freeway Northbound On/Off-Ramps -- Widen and/or modify the median island and restripe the westbound approach to the intersection (i.e., the off-ramp) to provide two left-turn-only lanes and a right-turn-only lane instead of the existing two-lane configuration.

- 10. I-405 Freeway Southbound On/Off-Ramps and 190th Street -- Flare the west leg of the intersection, restripe 190th Street, restrict parking and modify the signal to provide dual left-turn lanes in the eastbound direction.

- 11. Western Avenue and 190th Street -- Any mitigation would require a reduction below 11 foot interior lane widths and/or aquisition of right-of-way. Therefore, no feasible mitigation is available.

- 12. Western Avenue and 195th Street -- Fund the installation of the Automated Traffic Surveillance and Control (ATSAC) system at this location.

- 14. Western Avenue and Del Amo Boulevard -- Restripe the eastbound approach to convert the through lane to through/left optional lane and provide east-west opposed phasing. Remove the crosswalk on the north leg. Also, fund the installation of ATSAC at this location.

- 15. Western Avenue and Torrance Boulevard -- Any mitigation would require removal of parking, narrowing of the median containing the railroad tracks or aquisition of additional right-of-way, none of which is considered feasible. Therefore, no mitigation is available.

- 16. Western Avenue and Carson Street -- Mitigation of this impact would require removal of parking on Carson Street for which there is a heavy demand. Therefore, no mitigation is available.

- 17. Western Avenue and Sepulveda Boulevard -- Restrict parking to provide right-turn-only lanes in the northbound and southbound directions.

- o <u>18. Western Avenue and Pacific Coast Highway</u> -- Installation of mitigation would require interior lane width of less than 11 feet or an offsetting of lanes across the intersection. Therefore no mitigation is available.

- o <u>19. Project Roadway and 190th Street</u> -- Restrict parking and restripe 190th Street to provide three travel lanes plus left-turn channelization in the westbound and eastbound directions. Construct the internal project roadway to provide a three-lane northbound approach including two left-turn-only lanes and a right-turn-only lane.

- o <u>20. Normandie Avenue and Artesia Boulevard</u> -- Provide dual left-turn lanes in the southbound direction by restriping Normandie Avenue and modifying the signal.

- o <u>22. Normandie Avenue and I-405 Freeway Northbound On/Off-Ramps</u> -- Widen and restripe the northbound approach to provide two through lanes and an exclusive right-turn-only lane to facilitate freeway access. Fund ATSAC installation at this location.

- o <u>23. I-405 Freeway Southbound Off-Ramp/Project Driveway and 190th Street</u> -- Flare and restripe 190th Street to provide three travel lanes and dual left-turn lanes in the westbound direction and three travel lanes and a "pre-left-turn-lane" for Normandie Avenue in the eastbound direction. Construct the project driveway to provide dual left-turn lanes and a right-turn-only lane in the northbound direction. Install a signal with opposed northbound and southbound phasing. Fund ATSAC installation at this location.

  Should an LADOT review of operations at this intersection indicate that left-turns to or from the driveway would unacceptably interfere with the ability to coordinate this signal and the signal at 190th Street and Normandie Avenue, one or more turning movements could be restricted.

- <u>24. Normandie Avenue and 190th Street</u> -- Modify the signal and railroad crossing equipment on 190th Street to provide dual left-turn-only lanes plus three travel lanes in the eastbound and westbound directions. Modify the signal equipment to provide a southbound right-turn overlap phase. Additionally, fund the installation of ATSAC at this location.

- <u>25. Normandie Avenue and Project Roadway/Francisco Street</u> -- Construct the project roadway to provide a three-lane eastbound approach including a left-turn-only lane, a through/left optional lane and a right-turn-only lane. Modify the signal to provide opposed phasing in the eastbound and westbound directions.

- <u>26. Normandie Avenue and Torrance Boulevard</u> -- Fund the installation of ATSAC at this intersection.

- <u>27. Normandie Avenue and Carson Street</u> -- Fund the installation of ATSAC at this intersection.

- <u>30. Vermont Avenue and Artesia Boulevard</u> -- Flare and restripe Vermont Avenue and modify the signal equipment to provide dual left-turn lanes, two through lanes and a northbound right-turn-only lane in the northbound direction. Provide a northbound right-turn phase overlapping the existing westbound left-turn phase as part of the signal modifications.

- <u>31. Vermont Avenue and 190th Street</u> -- Restripe 190th Street to provide three through lanes in the eastbound and westbound directions. Fund the installation of ATSAC at this intersection.

- <u>32. Vermont Avenue and Torrance Boulevard</u> -- Restrict parking and restripe Vermont Avenue to provide a right-turn-only lane in the northbound and southbound directions.

- o 33. Vermont Avenue and Carson Street -- Restrict parking and restripe Vermont Avenue to convert the existing eastbound right-turn-only lane into a through/right optional lane.

- o 34. I-110 Freeway Southbound Off-Ramp and 190th Street -- Restripe 190th Street to provide three travel lanes in the westbound direction. Modify the signal to provide a southbound right-turn phase extension concurrent with the initiation of the eastbound through phase. Fund the installation of ATSAC at this intersection.

- o 35. I-110 Freeway Northbound On-Ramp and 190th Street -- Install a traffic signal at this location. Modify the median island, restrict parking and restripe 190th Street to provide dual eastbound left-turn lanes, including an HOV lane.

- o 36. Figueroa Street and 190th Street -- Restrict parking and restripe Figueroa Street to provide a southbound right-turn-only lane.

- o 39. Hamilton Avenue and Torrance Boulevard -- Restripe Hamilton Avenue to provide a left/right optional lane and a right-turn-only lane.

- o 40. Figueroa Street and Torrance Boulevard -- Remove the sidewalk along the south curb, restrict parking and restripe Torrance Boulevard to provide a left-turn-only lane, a through/left optional lane, and a through/right optional lane in the eastbound direction. Modify the signal to provide opposed east-west phasing.

- o 41. Harbor Freeway Southbound On-Off Ramps and Carson Street -- Restripe Carson Street to provide a right-turn-only lane in the eastbound direction.

Upon completion of the above improvements, project traffic impacts will be reduced to a level of insignificance at all but four intersections. Significant traffic impacts may also remain along area freeways.

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INTRODUCTION

The applicant, McDonnell Douglas Realty Company, plans to redevelop a 170-acre site located southwest of the San Diego Freeway and Harbor Freeway interchange in the City of Los Angeles. The proposed Harbor Gateway Center Master Plan project will be located on the parcel currently occupied by the McDonnell Douglas Aircraft Company. As shown on Figure 1, Site Vicinity Map, this site is bounded by 190th Street on the north, the Southern Pacific Railroad tracks paralleling Normandie Avenue on the east, industrial and residential properties on the south, and Western Avenue and industrial/vacant properties on the west.

As part of the environmental review process for the project, the applicant has retained Crain & Associates to assess the traffic impact of the proposed land development on the surrounding street and freeway system. This report represents the results of an analysis of existing conditions as well as projected traffic conditions after completion of the proposed project. As requested by the Los Angeles Department of Transportation, a detailed evaluation of existing and future peak hour traffic conditions has been completed at the forty-one study intersections listed below:

1. Hawthorne Boulevard and 190th Street
2. Crenshaw Boulevard and 182nd Street
3. Crenshaw Boulevard and San Diego Freeway southbound on/off-ramps
4. Crenshaw Boulevard and 190th Street
5. Crenshaw Boulevard and Del Amo Boulevard
6. San Diego Freeway northbound on/off-ramps and 182nd Street
7. Western Avenue and Artesia Boulevard
8. Western Avenue and 182nd Street

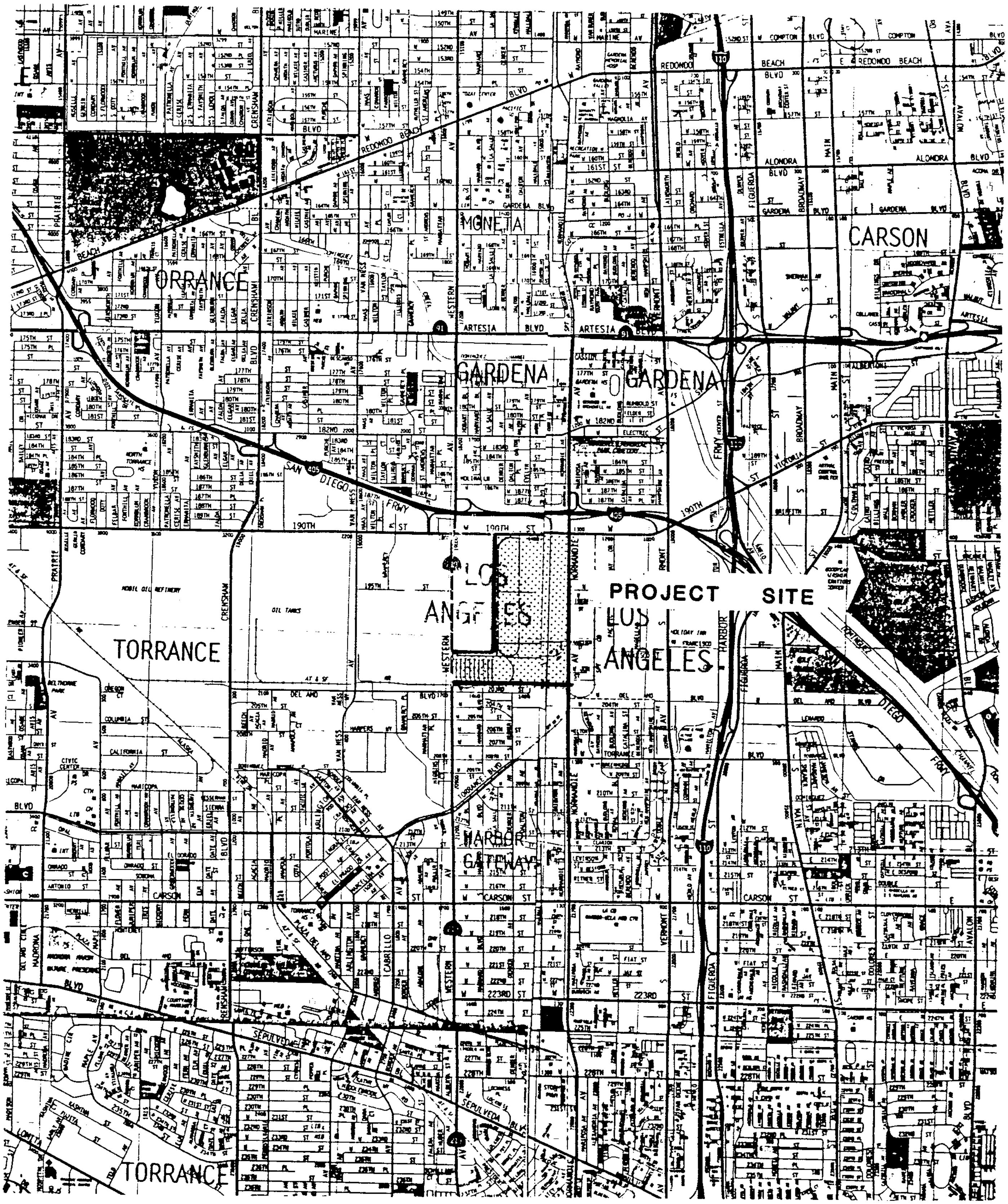

FIGURE 1

PROJECT VICINITY MAP

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9. Western Avenue and San Diego Freeway northbound on/off-ramps
10. San Diego Freeway southbound on/off-ramps
11. Western Avenue and 190th Street
12. Western Avenue and 195th Street
13. Western Avenue and Project Driveway
14. Western Avenue and Del Amo Boulevard
15. Western Avenue and Torrance Boulevard
16. Western Avenue and Carson Street
17. Western Avenue and Sepulveda Boulevard
18. Western Avenue and Pacific Coast Highway
19. Project Driveway and 190th Street
20. Artesia Boulevard and Normandie Avenue
21. Normandie Avenue and 182nd Street
22. Normandie Avenue and San Diego Freeway northbound on/off-ramps
23. San Diego Freeway off-ramp and 190th Street
24. Normandie Avenue and 190th Street
25. Normandie Avenue and Project Driveway/Francisco
26. Normandie Avenue and Torrance Boulevard
27. Normandie Avenue and Carson Street
28. Normandie Avenue and Sepulveda Boulevard
29. Normandie Avenue and Pacific Coast Highway
30. Vermont Avenue and Artesia Boulevard
31. Vermont Avenue and 190th Street
32. Vermont Avenue and Torrance Boulevard
33. Vermont Avenue and Carson Street
34. Harbor Freeway southbound off-ramp and 190th Street
35. Harbor Freeway northbound on-ramp and 190th Street

36. Figueroa Street and 190th Street
37. Hamilton Avenue and Harbor Freeway southbound on/off-ramps
38. Figueroa Street and Harbor Freeway northbound on/off-ramps
39. Hamilton Avenue and Torrance Boulevard
40. Figueroa Street and Torrance Boulevard
41. Harbor Freeway southbound on/off-ramps and Carson Street

These study intersections are within the area near the project site and are the locations most likely to be directly impacted by the project's traffic generation.

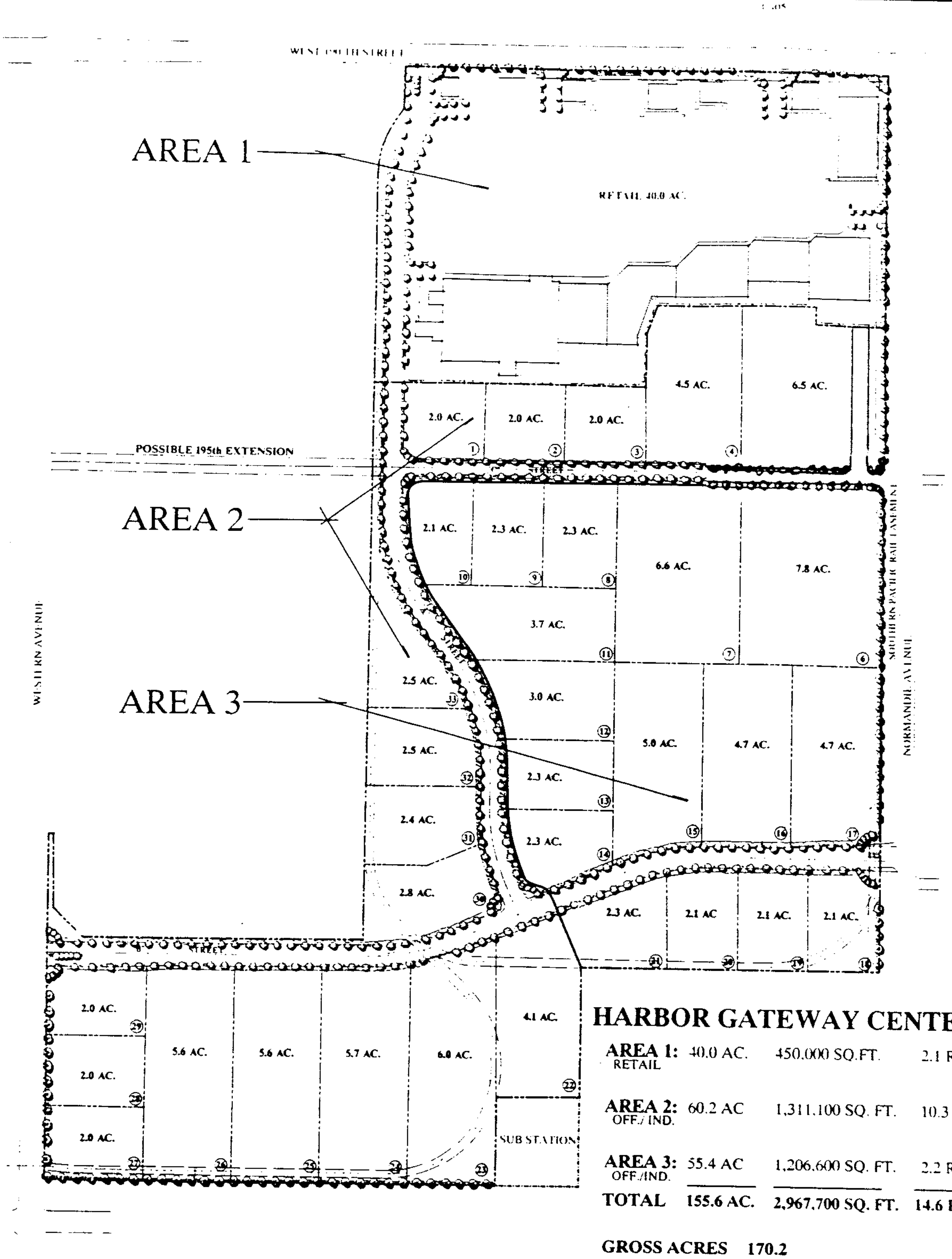
PROJECT DESCRIPTION

The project under consideration is the development of 170 acres southwest of the intersection of the San Diego Freeway and Harbor Freeway. The multi-use development plan consists of a 450,000 square foot shopping center on 42.1 gross acres and a 128.1 gross acre industrial/office park. Development in the industrial/office park could consist of up to 2,010,700 square feet of industrial park uses and up to 507,000 square feet of office park uses. The shopping center has been assumed to include up to 4,000 theater seats.

The site is currently occupied by a complex of industrial buildings totaling 2,419,000 square feet. These buildings are occupied by the McDonnell Douglas Aircraft Company. Until recently, the buildings were used for aircraft manufacturing and assembly, with approximately 5,500 employees working at the site. Currently, the buildings are used as a warehousing and distribution facility. All existing buildings would be removed from the site as part of the project.

Access to the site will be provided from 190th Street, Normandie Avenue, and Western Avenue. As shown in Figure 2, an internal roadway system will intersect each of these roadways. Additionally, access via an extension of 195th Street across the adjacent vacant site to the west, formerly used by Lockheed Aircraft, could be provided as part of the redevelopment of that site. Individual industrial and office parcels will, in general, receive all access from this internal roadway system. The exception is three parcels in the southwest corner of the site which will receive direct access from Western Avenue.

In addition to driveways to be located along the main north-south internal roadway, the project's shopping center would receive direct access from 190th Street and



HARBOR GATEWAY CENTER

AREA 1: RETAIL	40.0 AC.	450,000 SQ.FT.	2.1 ROAD AC.
AREA 2: OFF./IND.	60.2 AC	1,311,100 SQ. FT.	10.3 ROAD AC.
AREA 3: OFF./IND.	55.4 AC	1,206,600 SQ. FT.	2.2 ROAD AC.
TOTAL	**155.6 AC.**	**2,967,700 SQ. FT.**	**14.6 ROAD AC.**

GROSS ACRES 170.2

EXISTING DEVELOPMENT TO BE DEMOLISHED 2,419,000 SQ. FT.

NET NEW DEVELOPMENT 548,700 SQ. FT.

CONCEPT MAP

Harbor Gateway Center
McDonnell Douglas Realty Co.

FIGURE 2

PROJECT SITE PLAN

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Normandie Avenue. The 190th Street driveways would include a signalized driveway located opposite the southbound San Diego Freeway off-ramp, although some turning movements to and from this driveway could be restricted. The Normandie Avenue access to the retail center would be provided via a crossing of the Southern Pacific Railroad tracks leading directly to the center, in addition to the two other railroad crossings serving the overall internal street network.

ENVIRONMENTAL SETTING

As described previously, the site of the Harbor Gateway Shopping Center and Industrial Office/Park is situated in the Torrance-Gardena Corridor District of the City of Los Angeles. This area is served by three regional freeway facilities: the San Diego Freeway, the Harbor Freeway and the Artesia Freeway. This area once contained heavy industrial and oil refining facilities with surrounding, interspersed residential and agricultural areas. In recent years, new development in this area has been generally of the commercial office, office park and industrial park types. Some of this development (such as TRW) is oriented toward the remaining aerospace industry located in Torrance, Redondo Beach, and El Segundo. Other developments (such as offices for the Toyota and Nissan auto import/distribution companies) are oriented toward the Los Angeles-Long Beach Harbor facilities. This area is also well-served by other modes of transportation. Aside from the existing surface streets and freeway systems with good transit services, the harbor facilities, Los Angeles International Airport and several major rail facilities are located nearby.

The existing regional freeway system provides excellent access to this site. The project site is conveniently linked with Los Angeles International Airport (approximately 6 miles to the northwest) via the San Diego Freeway, and with Downtown Los Angeles (approximately 15 miles to the north) via the Harbor Freeway. San Pedro and the Los Angeles Harbor, approximately 7 miles to the south, are also conveniently accessible via the Harbor Freeway. Direct ramp access for the San Diego Freeway is provided by the Western Avenue and Normandie Avenue interchanges. Direct access to the Artesia and Harbor Freeways is provided via Artesia Boulevard to the north, 190th Street to the east and Torrance Boulevard to the south.

Streets and Highways

Two of the most important east-west highway facilities serving the project site and surrounding areas are 190th Street and Artesia Boulevard. Both streets are designated as major highways. 182nd Street is an important secondary arterial located approximately midway between 190th Street and Artesia Boulevard. Other important east-west arterials in this area are Torrance Boulevard and Carson Street, both to the south of the project site.

In the project vicinity, 190th Street is generally 85 feet wide. 190th Street operates as a four-lane arterial with left-turn channelization provided at all intersections. Double left-turn lanes have been provided on the eastbound approach at Western Avenue, and right-turn-only lanes have been installed where the demand is high and where there is sufficient room to accommodate the additional lane. During the morning and afternoon peak traffic periods, parking prohibitions are utilized so that 190th Street from west of Western Avenue to east of the Harbor Freeway operates as a six-lane facility, in order to more effectively handle the heavier peak traffic demands. The southbound San Diego Freeway off-ramp intersects 190th Street opposite the project site. This ramp, where it intersects with 190th Street, is 36 feet wide, providing for a two-lane approach, with one left-turn-only lane and one right-turn-only lane. This approach is presently controlled by a STOP sign.

Artesia Boulevard, from Normandie Avenue to just west of Western Avenue, is a six-lane highway which becomes a four-lane facility to the west. A typical cross-section of this highway includes two (divided) 35-foot roadways with a 14-foot wide raised median which provides for left-turn channelization at all intersections. Artesia Boulevard transitions directly into the Artesia Freeway immediately east of Vermont Avenue.

Del Amo Boulevard to the west of Western Avenue is 71 feet wide, and to the east is designated as 203rd Street and is 32 feet wide. This street operates as a two-lane facility in each direction with left-turn channelization provided at major intersections. The roadway is discontinuous throughout the area to the east of Western Avenue.

Torrance Boulevard is a four-lane highway west of the Harbor Freeway and becomes a two-lane facility and ends to the east of Main Street. Left-turn channelization is provided at all intersections. A typical cross-section of this highway to the west of the Harbor Freeway is 60 feet in width.

Two of the most prominent north-south highway facilities in the study area are Western Avenue and Vermont Avenue. Both of these arterials have been designated Major Highways on the City's General Plan. Other important north-south routes in this area include Crenshaw Boulevard to the west and Figueroa Street and Normandie Avenue to the east.

Western Avenue presently operates as a four-lane facility throughout this area, although localized improvements at 190th Street have made it possible to provide three through lanes in each direction. Double left-turn lanes for northbound traffic desiring to turn west onto 190th Street towards the southbound San Diego Freeway on-ramp are also provided. Dual southbound left-turn lanes are provided as well. North of 190th Street, Western Avenue is 110 feet wide, but tapers to an 84-foot width further to the north. South of 190th Street, Western Avenue is 98 feet wide, and provides three travel lanes in each direction. Further to the south, Western Avenue provides two northbound and three southbound travel lanes.

Vermont Avenue, throughout the study area, is fully developed to a width of 80 feet, except along the east side in front of Ascot Park (between 182nd Street and the San Diego Freeway) where the shoulder area remains unimproved. This arterial provides for two lanes of traffic in each direction with left-turn channelization provided at all intersections. The on-ramp to the northbound San Diego Freeway is located along Vermont Avenue approximately 380 feet north of 190th Street. This ramp is 28 feet wide at Vermont Avenue, but narrows to a single lane before it merges with the freeway. As part of their ramp metering system, Caltrans presently meters this on-ramp during peak hours. Although the ramp queues are often substantial, they generally do not impact surface street traffic flow along Vermont Avenue.

Normandie Avenue presently operates as a four-lane facility throughout the study area, with left-turn channelization at intersections. Immediately north and south of 190th Street, Normandie Avenue is 72 feet wide but is narrower further to the south. A southbound on-ramp for the San Diego Freeway is provided just north of 190th Street on Normandie Avenue. Northbound on- and off-ramps to the San Diego Freeway are also provided further to the north.

<u>Existing Traffic Volumes</u>

Traffic volume count data was obtained from the City of Los Angeles and Caltrans. New counts were conducted by Crain & Associates at all study locations where recent counts were not available. The counts were adjusted to reflect full operation of the project site as a warehouse facility. The results were used to determine the existing traffic and turning movement volumes at each of the study locations during the AM and PM peak periods. The AM peak hour traffic volumes at the study intersections are summarized in Figure 3(a) for 1996 conditions. The corresponding PM peak hour volumes are shown in Figure 3(b).

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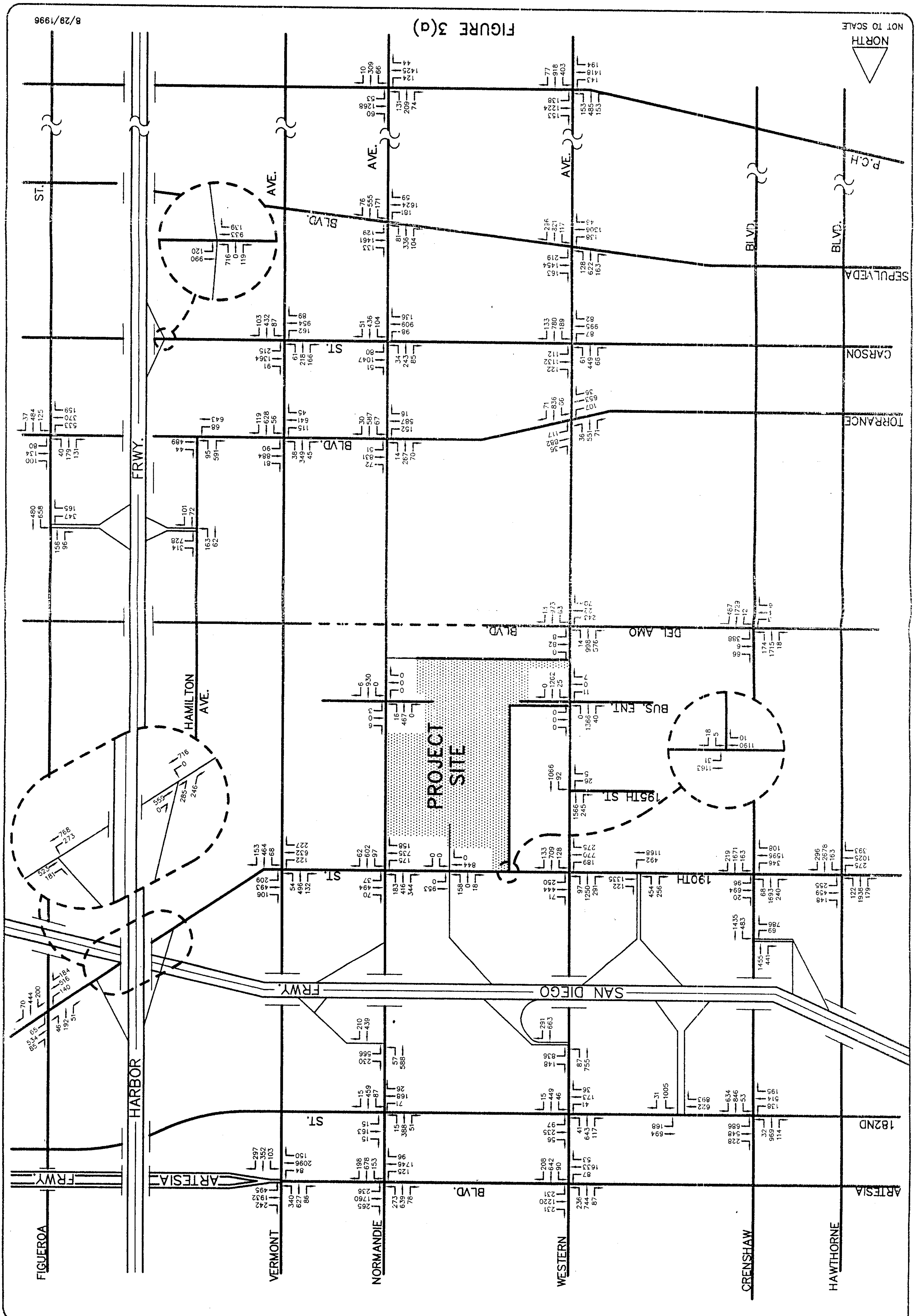
EXISTING (1996) TRAFFIC VOLUMES
AM PEAK HOUR

FN: MCDONNEL\AM1996



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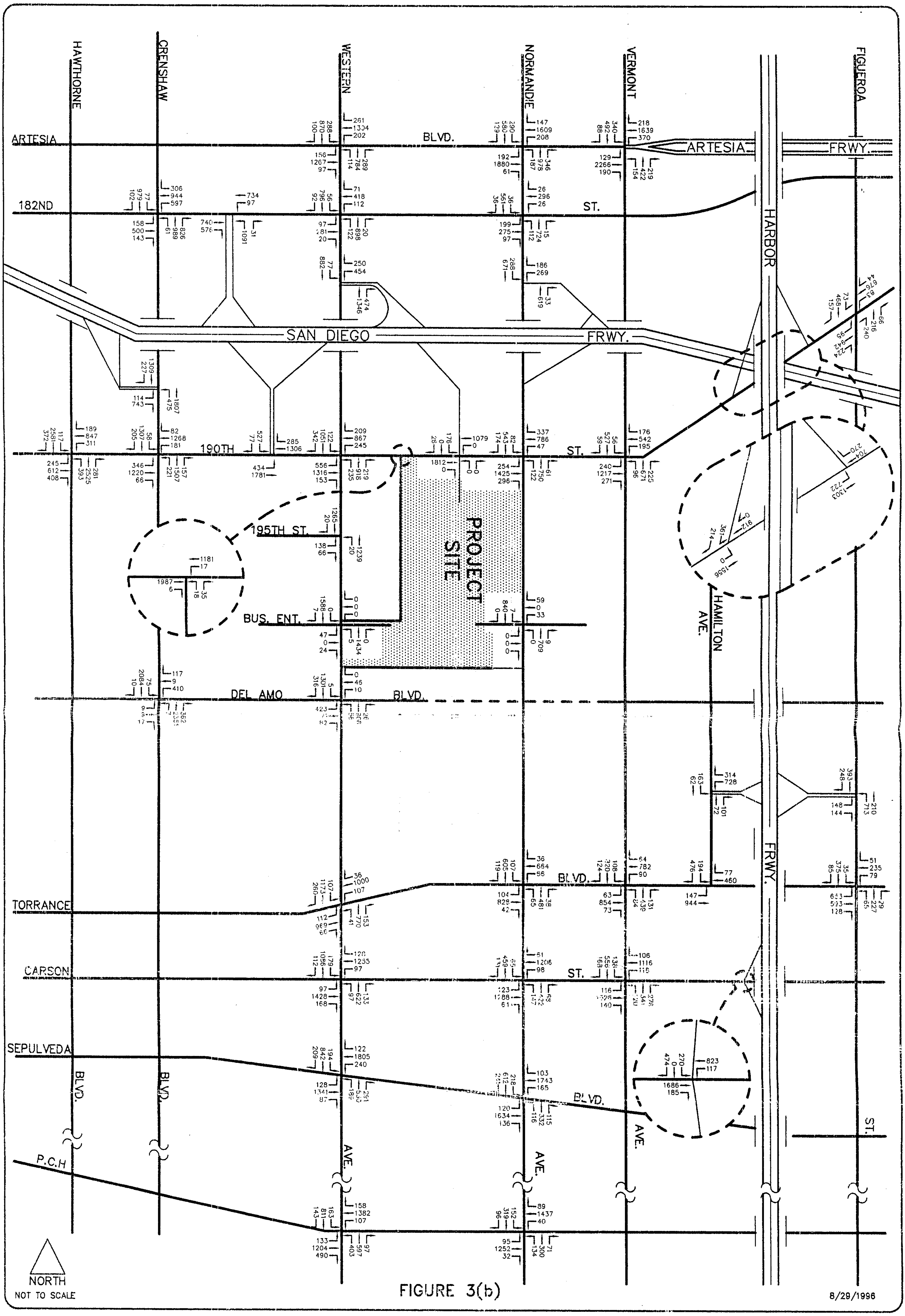

FIGURE 3(b)

FN: MCDONNEL\PM1996

EXISTING (1996) TRAFFIC VOLUMES
PM PEAK HOUR

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Public Transportation

The site is served by two bus lines which are operated by Gardena Transit (Line 2) and Torrance Transit (Line 6). These bus lines operate along the roadways adjacent to the proposed project site. These and other connecting bus lines offer extensive access to adjacent South Bay communities and also provide convenient, direct access into Downtown Los Angeles.

The following bus lines operate adjacent to the proposed development:

> Gardena Line 2. This "rectangular" route involves primarily north-south travel on Western Avenue, Normandie Avenue, and Vermont Avenue, between Pacific Coast Highway on the south and Imperial Highway on the north. Half-hour headways are typical in both directions during all hours of operation.
>
> Torrance Line 6. This linear line provides service between the Del Amo Center and Torrance Civic Center to the southwest and Cal State Dominguez Hills and the Artesia Station of the Metro Blue Line to the east. In the vicinity of the project site it operates along 190th Street. It provides service on half-hour headways in both directions during peak periods on Mondays through Fridays. No midday, night or weekend service is provided.

The following bus lines also operate in the study area, although somewhat further away from the project site than would be considered within normal walking distance for transit access:

> Torrance Line 1. This bus line provides service between the Del Amo Fashion Square regional shopping center in Torrance and Union Station in Downtown Los Angeles. This route crosses on Carson Street to Vermont Avenue, then

proceeds north to Gardena Boulevard and then north on Figueroa Street to the Harbor Freeway at El Segundo Boulevard. Buses exit the freeway at Martin Luther King, Jr. Boulevard and then traverse the Downtown Los Angeles area to the terminus at Union Station. Buses on this route operate on a typical headway of one hour, but service with half-hour headways is provided during peak commuter periods (6:00 - 9:00 AM and 3:00 - 6:00 PM). Access for the handicapped is provided on all of the buses operated on this line.

MTA Line 130. This line operates east-west between King Harbor in Redondo Beach and the Fullerton Park-and-Ride Lot at Orangethorpe Avenue and Magnolia Avenue. Intermediate portions of this route run primarily along Artesia Boulevard, but the route diverts south at Vermont Avenue, turning easterly at 190th Street. Daylight service is provided on typical headways of one hour, several days per week. Access for the handicapped is provided on all of these buses.

MTA Line 445. This line offers peak hour commuter service between San Pedro and Alpine Village (approximately one mile southeast of the project site), and Downtown Los Angeles. Most of this route runs along the Harbor Freeway but traverses Downtown on surface streets. Five buses each provide service Monday through Friday, into Downtown during the peak AM commuter period and outbound during the PM peak period.

The bus lines discussed above provide important service to the existing industrial and residential areas, and office facilities located near the proposed development.

Analysis of Existing Conditions

The traffic analysis was performed through use of established traffic engineering techniques. The existing traffic volumes described earlier were utilized so as to reflect any recent changes in traffic demand patterns. Other data pertaining to intersection geometrics, transit stop locations, parking related curb restrictions, pedestrian facilities, and signal operations were obtained through field surveys of the study area street system.

The Critical Movement Analysis (CMA) methodology used for the analysis and evaluation of traffic conditions at each study intersection is based on procedures outlined in Circular Number 212 of the Transportation Research Board[1]. In the discussion of the CMA method for signalized intersections, procedures have been developed for grading the operational quality of an intersection in terms of the "Level of Service" (LOS) which describes different traffic flow characteristics. LOS A to C operate quite well. LOS D typically is the level for which a metropolitan area street system is designed. LOS E represents volumes at or near the capacity of the street which might result in stoppages of momentary duration and fairly unstable flow. LOS F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

A determination of the LOS at an intersection, where traffic volumes are known or have been projected, can be obtained through a summation of the critical movement volumes: the highest combination of conflicting movements which must be accommodated at that intersection. Once the sum of critical movement volumes has been obtained, the values in Table 1 can be used to determine the applicable LOS.

---

1 Interim Materials on Highway Capacity, Circular Number 212, Transportation Research Board, Washington, D. C., 1980.

Table 1
Critical Movement Volume Ranges*
For Determining Levels of Service

Level of Service	Maximum Sum of Critical Volumes (VPH) Two Phase	Three Phase	Four or More Phases
A	900	855	825
B	1,050	1,000	965
C	1,200	1,140	1,100
D	1,350	1,275	1,225
E	1,500	1,425	1,375
F	---------------Not Applicable-------------		

* For planning applications only, i.e., not appropriate for operations and design applications. Also, a computerized traffic signal coordination systems, such as the Automated Traffic Surveillance and Control (ATSAC), increase these values by approximately seven percent.

"Capacity" represents the maximum volume of vehicles in the critical lanes which has a reasonable expectation of passing through an intersection in one hour, under prevailing roadway and traffic conditions. For planning purposes, capacity equates to the maximum value of LOS E, as indicated in Table 1. The CMA values used in this study were calculated by dividing the sum of critical movement volumes by the appropriate capacity value for the type of signal control present or proposed at the study intersections. The Level of Service values are defined as a range of CMA values and shown in Table 2.

Table 2
Level of Service
As a Function of CMA Values

Level of Service	Interpretation	Range of CMA Values
A	Uncongested operations; all vehicles clear in a single cycle.	≤ 0.60
B	Same as above.	$>0.60 \leq 0.70$
C	Light congestion; occasional backups on critical approaches.	$>0.70 \leq 0.80$
D	Congestion on critical approaches, but intersection functional. Vehicles required to wait through more than one cycle during short peaks. No long-standing lines formed. Used as the desirable level for design in many cities.	$>0.80 \leq 0.90$
E	Severe congestion with some long-standing lines on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements.	$>0.90 \leq 1.00$
F	Forced flow with stoppages of long duration.	> 1.00

By applying this analysis procedure to the study intersections, the CMA value and the corresponding LOS for existing traffic conditions were calculated. Those values for existing (1996) AM and PM peak hour conditions are shown in Table 3.

Table 3
Critical Movement Analysis Summary
Existing Traffic Conditions

	Intersection	AM Peak Hour CMA	AM Peak Hour LOS	PM Peak Hour CMA	PM Peak Hour LOS
1.	Hawthorne Blvd. and 190th St.	1.010	F	1.033	F
2.	Crenshaw Blvd. and 182nd St.	0.909	E	1.065	F
3.	Crenshaw Blvd. and San Diego Fwy. S/B on/off-ramps	0.997	E	0.910	E
4.	Crenshaw Blvd. and 190th St.	1.237	F	1.240	F
5.	Crenshaw Blvd. and Del Amo Blvd.	0.807	D	0.868	D
6.	San Diego Fwy. N/B on/off-ramps and 182nd St.	0.880	D	0.877	D
7.	Western Ave. and Artesia Blvd.	0.982	E	0.988	E
8.	Western Ave. and 182nd St.	0.418	A	0.605	B
9.	Western Ave. and San Diego Fwy. N/B on/off-ramps	0.607	B	0.735	C
10.	San Diego Fwy. S/B on/off-ramps and 190th St.	1.063	F	0.975	E
11.	Western Ave. and 190th St.	0.712	C	0.915	E
12.	Western Ave. and 195th St.	0.481	A	0.391	A
13.	Western Ave. and Project Dwy.	0.354	A	0.410	A
14.	Western Ave. and Del Amo Blvd.	0.707	C	0.747	C
15.	Western Ave. and Torrance Blvd.	0.625	B	0.716	C
16.	Western Ave. and Carson St.	0.777	C	1.023	F
17.	Western Ave. and Sepulveda Blvd.	0.991	E	1.080	F
18.	Western Ave. and Pacific Coast Hwy.	0.964	E	0.997	E
19.	Project Dwy. and 190th St.	0.428	A	0.729	C
20.	Normandie Ave. and Artesia Blvd.	0.874	D	1.002	F
21.	Normandie Ave. and 182nd St.	0.311	A	0.513	A

Table 3 (cont.)
Critical Movement Analysis Summary
Existing Traffic Conditions

	Intersection	AM Peak Hour CMA	AM Peak Hour LOS	PM Peak Hour CMA	PM Peak Hour LOS
22.	Normandie Ave. and San Diego Fwy. N/B on/off-ramps	0.519	A	0.561	A
23.	San Diego Fwy. S/B off-ramp and 190th St.	0.470	A	0.839	D
24.	Normandie Ave. and 190th St.	0.665	B	0.930	E
25.	Normandie Ave. and Project Dwy./ Francisco St.	0.329	A	0.341	A
26.	Normandie Ave. and Torrance Blvd.	0.617	B	0.619	B
27.	Normandie Ave. and Carson St.	0.600	A	0.811	D
28.	Normandie Ave. and Sepulveda Blvd.	0.708	C	0.770	C
29.	Normandie Ave. and Pacific Coast Hwy.	0.502	A	0.561	A
30.	Vermont Ave. and Artesia Blvd.	0.913	E	0.883	D
31.	Vermont Ave. and 190th St.	0.716	C	1.013	F
32.	Vermont Ave. and Torrance Blvd.	0.673	B	0.740	C
33.	Vermont Ave. and Carson St.	0.747	C	0.853	D
34.	Harbor Fwy. S/B off-ramp and 190th St.	0.429	A	0.759	C
35.	Harbor Fwy. N/B on-ramp and 190th St.	0.446	A	0.895	D
36.	Figueroa St. and 190th St.	0.486	A	0.737	C
37.	Hamilton Ave. and Harbor Fwy. S/B on/off-ramps	0.423	A	0.423	A
38.	Figueroa St. and Harbor Fwy. N/B on/off-ramps	0.694	B	0.786	C
39.	Hamilton Ave. and Torrance Blvd.	0.743	C	0.673	B
40.	Figueroa St. and Torrance Blvd.	0.667	B	0.768	C
41.	Harbor Fwy. S/B on/off-ramps and Carson St.	0.850	D	0.738	C

PROJECT TRAFFIC

The following section contains information describing the vehicular trip generating characteristics of the proposed project. It also presents the methodology used to estimate the trip generation, distribution and assignment of the project traffic.

Traffic Generation

Traffic-generating characteristics of the land uses similar to the proposed project have been surveyed and documented by the Institute of Transportation Engineers (ITE). Those studies have indicated that land uses of the size associated with the proposed project generally exhibit the following trip-making characteristics.

Table 4
Project Trip Generation Formulas

Shopping Center - (per 1,000 sq. ft.)
- Daily: Ln (T) = 0.625 Ln (A) + 5.985
- AM Peak Hour: Ln (T) = 0.589 Ln (A) + 2.378; I/B = 63%, O/B = 37%
- PM Peak Hour: Ln (T) = 0.637 Ln (A) + 3.553; I/B = 50%, O/B = 50%

Movie Theater - (per seat)
- Daily: T = 0.48 (A)
- AM Peak Hour: T = 0.03 (A); I/B = 63%, O/B = 37%
- PM Peak Hour: T = 0.06 (A); I/B = 64%, O/B = 36%

Industrial Park - (per 1,000 sq. ft.)
- Daily: T = 4.949 Ln(A) + 765.587
- AM Peak Hour: Ln(T) = 0.818 Ln(A) + 0.916; I/B = 82%, O/B = 18%
- PM Peak Hour: $T = [(1.027/A) + 0.00064]^{-1}$; I/B = 21%, O/B = 79%

Office Park - (per 1,000 sq. ft.)
- Daily: T = 0.835 Ln(A) + 3.435
- AM Peak Hour: T = 0.818 Ln(A) + 1.679; I/B = 89%, O/B = 11%
- PM Peak Hour: T = 0.825 Ln(A) + 1.418; I/B = 15%, O/B = 85%

Warehouse/Distribution Center - (per 1,000 sq. ft.)
- Daily: T = 3.68(A) + 342.65
- AM Peak Hour: T = 0.382 (A) + 79.314; I/B = 72%, O/B = 28%
- PM Peak Hour: T = 0.488 (A) + 74.974; I/B = 35%, O/B = 65%

Accordingly, on the basis of the traffic generation formulas in Table 4, the projected amount of new traffic volume that could be generated by the proposed mixed-use project is shown in Table 5. Appendix A separates this generation by project phase. It should be noted that Table 5 and Appendix A contain standard internal trip generation and pass-by trip adjustments. These reflect that many of the trips to and from the site will utilize more than one facility and/or will be made as part of a larger trip which would have traveled past the site whether or not the center was present.

Trip Distribution

The next step in the process was the determination of the geographic distribution of project trips. A primary factor affecting trip direction is the relative distribution of the housing from which employees of the proposed business/industrial park and patrons of the shopping center would be drawn. Each trip to and from the project site will be linked to another site somewhere in the region. These trip linkages are analyzed by the City of Los Angeles Framework computerized traffic model. This model considers the land-use patterns throughout the Southern California area to estimate current trip-making patterns. It also considers future land-use growth patterns to determine how trip linkages and travel patterns may change over time, due to shifts in the housing and/or employment base locations. In particular, the model considers the amount of housing and employment growth or decline within each subarea comprising the modeled area to determine changes in the distance each area's residents must travel to find adequate employment opportunities.

The estimated directional trip distribution resulting from this analysis is shown in Table 6.

Table 5
Project Traffic Generation

Land Use Category	Size (Sq. Ft.)	Daily Traffic	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Shopping Center Gross Generation								
Retail	385,000	15,010	212	125	337	712	711	1,423
Theater, 4,000 seats	65,000	1,930	76	44	120	154	86	240
Subtotal	450,000	16,940	288	169	457	866	797	1,663
Less Shopping Center Internal/Pass-By Trips								
Retail (1%/20%)		(3,000)	(42)	(25)	(67)	(142)	(142)	(284)
Theater (10%/10%)		(390)	(15)	(9)	(24)	(31)	(17)	(48)
Subtotal		(3,390)	(57)	(34)	(91)	(173)	(159)	(332)
Net Shopping Center Generation		13,550	231	135	366	693	638	1,331
Shopping Center	450,000	13,550	231	135	366	693	638	1,331
Office Park	507,000	5,630	779	96	875	106	598	704
Industrial Park	2,010,700	10,720	1,105	150	1,255	131	741	872
Site Generation	2,967,700	29,900	2,115	381	2,496	930	1,977	2,907
Less Without Project Site Generation Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation	548,700	21,340	1,507	144	1,651	543	1,259	1,802

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Table 6
Directional Regional Trip Distribution

Direction	Percentage of Trips
North	30%
South	30
East	25
West	15
	100%

Traffic Assignment

The City of Los Angeles Framework computerized traffic model was utilized to assign project-related traffic to individual roadways within the study area. In doing so, the model accounted for the level of congestion on each roadway and determined which travel path produced the shortest travel time for each trip. The results of this computerized assignment were carefully examined for "reasonableness", but no adjustments were considered necessary to reflect likely travel paths. It should be noted that the computer model assumes drivers will follow the most direct, rational path. The direct path methodology has been shown to produce the most reliable overall traffic projections. Further, this procedure concentrates traffic volumes and any necessary roadway improvements on the preferred (Major) routes, rather than encouraging the use of minor routes. The results of the computerized traffic assignment provides the necessary level of detail to conduct the traffic analysis. The resulting project trips on the surrounding roadway system are shown in Figures 4(a) and 4(b).

Parking and Access

Parking lots/structures supporting the individual uses will be constructed as build out of the multi-use development is completed. All parcels will be provided sufficient parking to meet code requirements within that parcel. For the shopping center, this

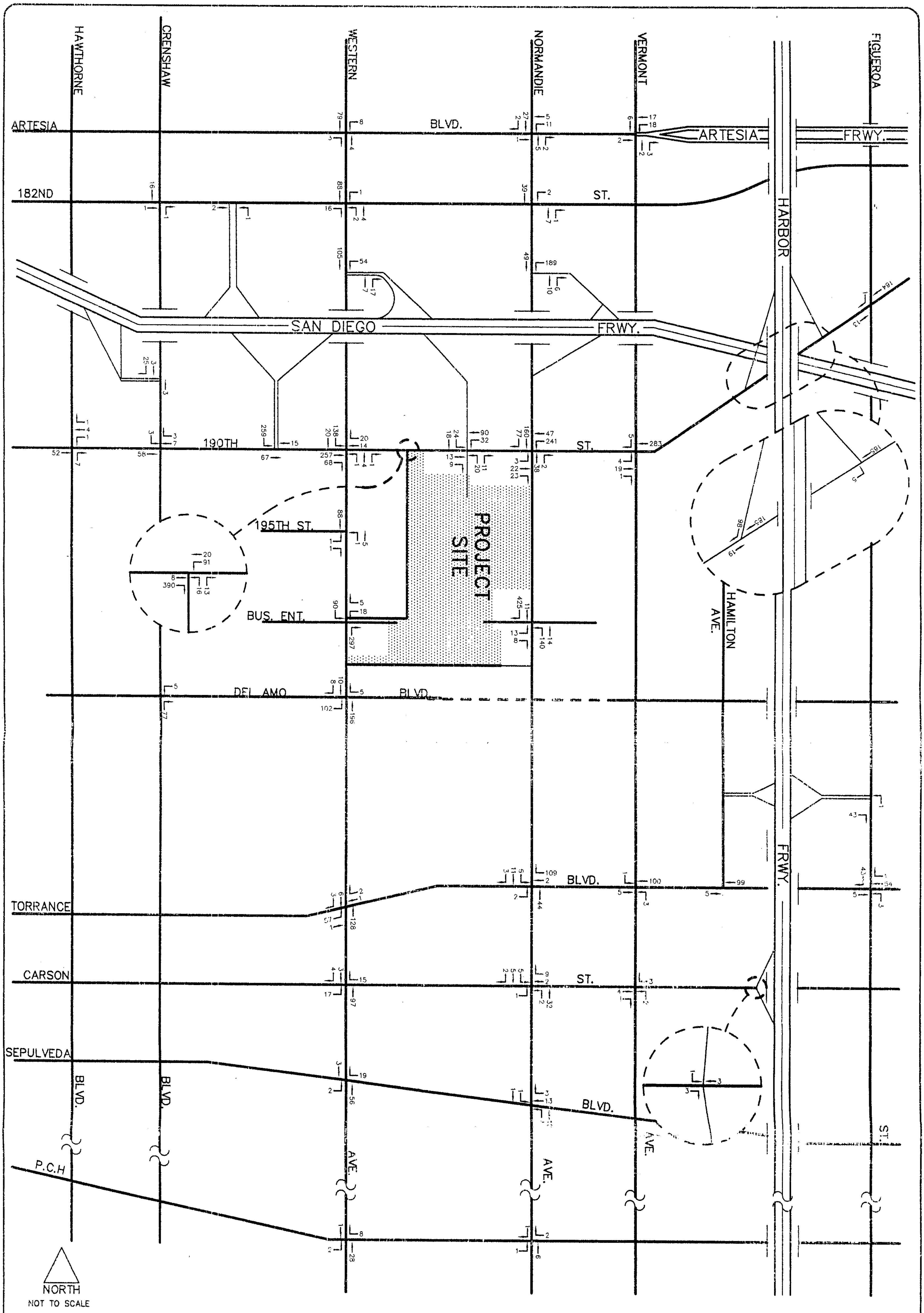

FIGURE 4(a)

10/22/1996

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PROJECT TRAFFIC VOLUMES
AM PEAK HOUR

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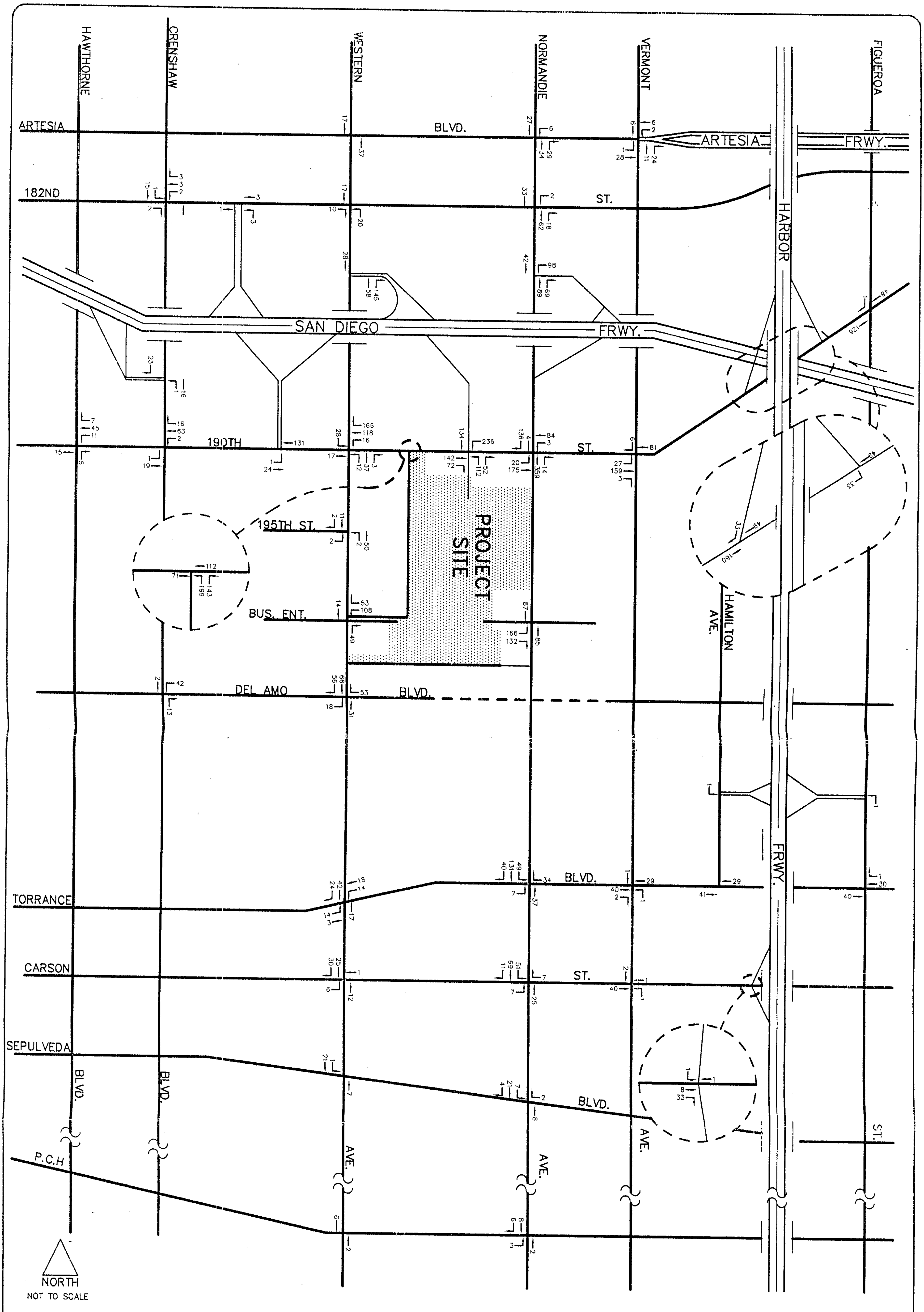

FIGURE 4(b)

10/22/1996

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PROJECT TRAFFIC VOLUMES
PM PEAK HOUR

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may include consideration of shared parking between the theater, restaurant and retail uses. As shown in Appendix C, the highest demand for parking at the shopping center, as it is currently envisioned, would be just under 1,800 spaces. This maximum demand would occur on weekend afternoons in December.

Access to the site will be provided from 190th Street, Normandie Avenue, and Western Avenue. As shown in Figure 2, an internal roadway system will intersect each of these roadways. Additionally, access via an extension of 195th Street across the adjacent vacant site to the west, formerly used by Lockheed Aircraft, could be provided as part of the redevelopment of that site.

Individual industrial and office parcels will, in general, receive all access from this internal roadway system. As an exception, up to three industrial/office parcels could also receive direct access from the surrounding street system. These parcels are located in the southwest corner of the project and would receive direct access from Western Avenue.

The project's shopping center would receive direct access from 190th Street and Normandie Avenue in addition to driveways to be located along the main north-south internal roadway. The 190th Street driveways would include a signalized driveway located opposite the southbound San Diego Freeway off-ramp, although some turning movements to and from this driveway could be restricted. The Normandie Avenue access would be provided via a crossing of the Southern Pacific Railroad tracks leading directly to the Center, in addition to the two other railroad crossings serving the overall internal street network.

In addition to the shopping center driveways, two other railroad crossings would be used to access the project site. One would be a new access roadway in alignment with Knox Street and 195th Street. The other would be an upgrade of the existing driveway accessing the site opposite Francisco Street. Since the Southern Pacific

Railroad track involved in all of these crossings is a very lightly used rail line, these crossings are considered appropriate.

The intersections of the major project access roads and driveways with the public street system would be signalized. A total of six locations are proposed to be signalized, including:

- o Western Avenue and Project Roadway (existing signal)
- o 190th Street and Project Roadway (relocated signal)
- o 190th Street and San Diego Freeway Southbound Off-Ramp/Shopping Center Drive (new signal)
- o Normandie Avenue and Shopping Center Driveway (new railroad crossing/signal)
- o Normandie Avenue and Knox Street/Project Roadway (new railroad crossing/signal)
- o Normandie Avenue and Project Roadway/Francisco Street (existing signal)

Of these, two have existing signals, one will have a relocated existing signal and a fourth is at the intersection of a freeway ramp and a major highway. The final two signals are needed to allow a full four-way driveway across the railroad tracks paralleling Normandie Avenue. Thus, all six signals are considered necessary.

FUTURE TRAFFIC CONDITIONS

There are a number of other projects either under construction or planned for development which will add new traffic volumes to the study area. For this reason, the analysis of future traffic conditions has been expanded to include potential traffic volumes expected to be generated by projects that have not yet been developed but are planned within the study area in the near future.

The transportation network used in the model to project future traffic conditions was based on the City of Los Angeles Framework traffic forecasting model, which was developed using the regional model developed by the Southern California Association of Governments (SCAG) and the Los Angeles Regional Transportation Study (LARTS) section of Caltrans. The SCAG/LARTS model is the primary long-range transportation planning tool for the Los Angeles region. Of particular relevance, this model includes provisions of an expanded High-Occupancy Vehicle (HOV) lane network, such as the recently completed or currently under construction HOV lanes on the Harbor, San Diego, Ventura, Hollywood and Simi Valley Freeways, as well as those programmed for the Antelope Valley Freeway. This model also considers the impacts of the expanding transit network, including extension of the Metro Blue-Line. However, it does not include other improvements considered less assured. Examples include trip reduction measures required by the South Coast Air Quality Management District (SCAQMD) and the Los Angeles County Congestion Management Program (CMP).

While the Framework model provides an overall view of the transportation patterns and characteristics within the Los Angeles area, its emphasis on subregional planning does not provide the level of detail necessary to forecast individual turning movements at specific intersections with acceptable precision. As part of this study, the roadway network contained within the Framework model was refined to better reflect the capacities and constraints of the transportation system within the study area, specifically the study intersections and freeway interchanges.

Related Projects/Cumulative Growth

The SCAG regional and the City of Los Angeles land use data were augmented by a search for specific development projects within the study area, which are on file with the Cities of Los Angeles, Torrance, Carson and Gardena. These "related projects" included projects which are completed but not fully occupied, are currently under construction or beginning construction, or are presently only proposed but which could become operational within the time frame examined in this study.

It should be noted that the related projects list was developed in consultation with the planning staffs from each relevant jurisdiction. In particular, extensive discussions were held with the City of Torrance Planning Department to make certain that the Allied Signal and other related projects near the project were represented as accurately as possible.

From a review of these lists, it was determined that traffic from thirty-six projects near the study site would produce additional traffic at the study intersections. These related projects are listed and described in Table 7. The locations of these related projects are shown in Figure 5.

To determine the 2006 "null" or non-project traffic conditions, the greater of the trip generation for each zone, based on a comparison of the City of Los Angeles land-use growth projections data, and the sum of the new related projects proposed for each zone, was used as the incremental growth for that zone. The resulting 2006 AM and PM peak hour traffic volume estimates are shown in Figures 6(a) and (b), respectively. These estimates form the basis for determining project traffic impacts

Table 7
Related Projects List

Project No.	Description	Reference No.	Location
1.	25,000 s.f. Church		1251 W. Redondo Beach Blvd.
2.	Expansion from 8,030 s.f. to 37,000 s.f. of Office		1116 W. Redondo Beach Blvd.
3.	54,000 s.f. Supermarket		NEC Western Ave. & Artesia Blvd.
4.	195-Unit Senior Housing and Recreation Bldg.	CUP 94-0001	4502 186th St.
5.	14,000 s.f. Fitness Center	CUP 95-0006	SEC 190th St. & Crenshaw Ave.
6.	135,000 s.f. Hospital Addition	CUP 94-0005	4101 Torrance Blvd.
7.	44,326 Office/Warehouse	CUP 94-0035	3500 Challenger St.
8.	8,000 s.f. Retail	CUP 94-0025	540 Maple Ave.
9.	72-Unit Senior Citizen Condominiums	CUP 93-0005	23860 Los Codona Ave.
10.	46,000 s.f. Office	CUP 90-32	SEC Amie Ave. & Torrance Blvd.
11.	7,219 Restaurant	CUP 95-0016	21880 Hawthorne Blvd.
12.	33,898 Office		NWC Hawthorne Blvd. & 230th St.
13.	24,530 sf Hospital Expansion	CUP 76-90	3330 Lomita Blvd.
14.	60,000 s.f. Medical Office	PP 72-14	3400/3440 Lomita Blvd.
15.	36-Unit Senior Citizen Condominiums	CUP 93-0036	235th St. SS between Elm Ave. & Crenshaw Blvd.
16.	191,196 s.f. Industrial/Warehouse Building		Amapola Ave. between 208th St. & Dominguez St.
17.	167,000 s.f. Storage Facility 6,175 s.f. Retail	CUP 96-0002	WS Crenshaw Blvd. N/O Lomita Blvd.
18.	Remodeling Shopping Center; Demolish 30,475 Retail/ Restaurant; Demolish 29,944 s.f. Health Club; Remove 15 Tennis Courts; Construct 16,700 Retail/ Restaurant; Addition of 14 Screens to an Existing 6-screen Theatre		Rolling Hills Plaza Shopping Center

Table 7 (cont.)

Related Projects List

Project No.	Description	Reference No.	Location
19.	28-Unit Single Family Homes	2C 91-2	220 Via Riviera
20.	640,000 s.f. Retail 159,000 Office 127,000 Light Industrial		Carson Towne Center
21.	1,870,000 s.f. Retail		Metro 2000 Outlet Center
22.	18-Unit Single Family Homes	CUP 94-0013	1425 Engracia
23	20,400 s.f. Office/Warehouse	MOD 95-0006	NEC Madrid & Dominguez Wy.
24.	90-Unit Condominiums	CUP 88-62	5501 Torrance Blvd.
25.	54-Unit Condominiums	CUP 90-2	4921 Spencer St.
26.	11,094 s.f. Church	CUP 95-0026	4625 Garnet St.
27.	131-Unit Condominiums	PD 89-1	2801 Sepulveda Blvd.
28.	52-Unit Condominiums	PD 89-2	2801 Sepulveda Blvd.
29.	84-Unit Condominiums	ZC 90-1	2825 Plaza Del Amo
30.	14,200 s.f. Auto Service Center	CUP 94-0022	SEC Artesia Blvd. & Prairie Ave.
31.	190,000 s.f. Shopping Center		NEC Western Ave. & Artesia Blvd.
32.	3,245 s.f. Mini-Mart/Gas Station		NWC Vermont Blvd. & Artesia Blvd.
33.	755,000 s.f. Shopping Center 3,500 seat Theatre		SEC Western Ave. & 190th St.
34.	44-Unit Townhomes Brisas Del Mar		NWC El Prado & Cravens Ave.
35.	2,512 Million s.f. of Office, Industrial, Research and Development and Related Commercial Services		SWC Western Ave. & 195th St. (Allied Signal Property)
36.	156,000 s.f. Shopping Center		Price-Costco, Lomita Blvd.

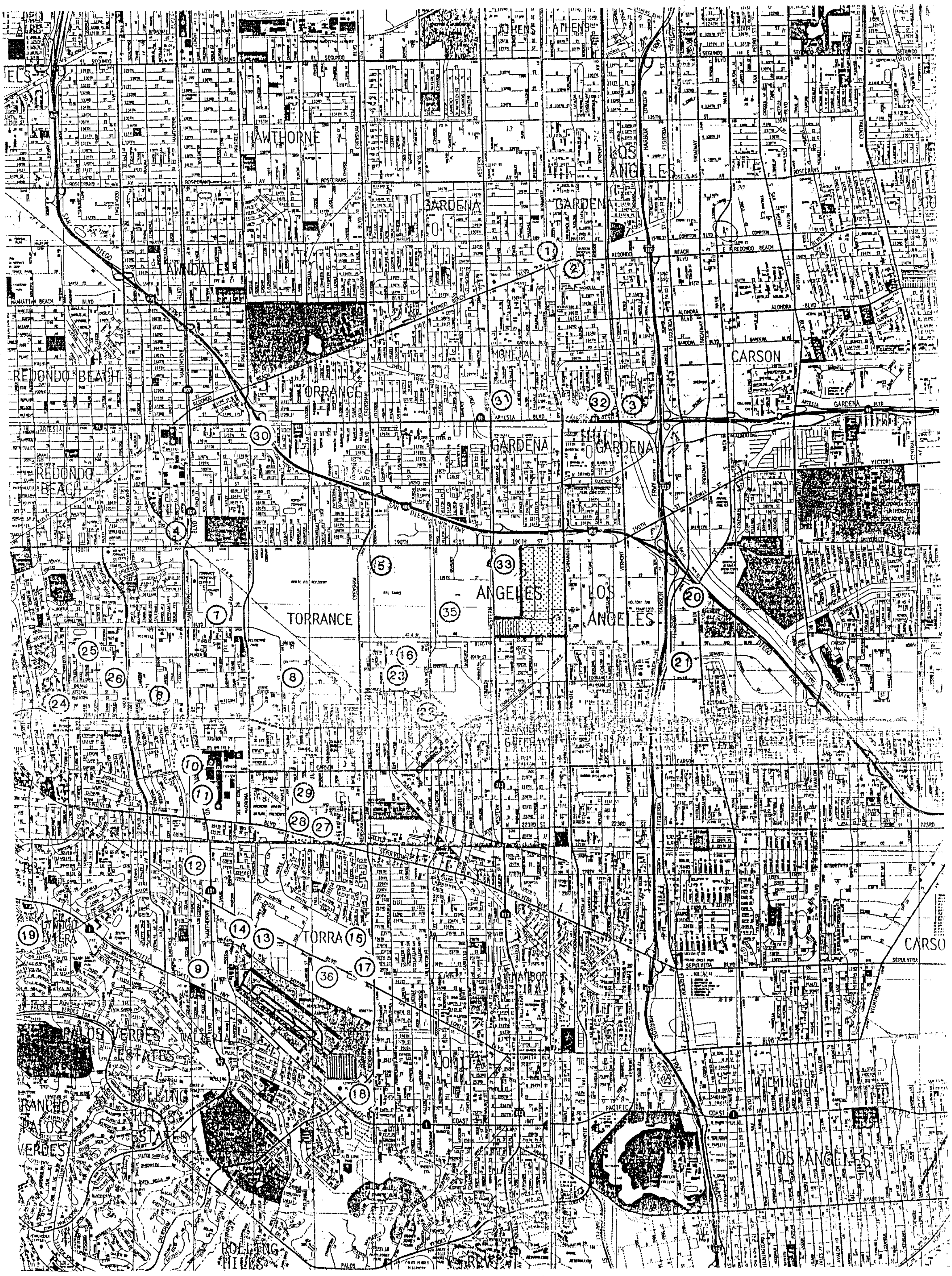

FIGURE 5

RELATED PROJECTS MAP

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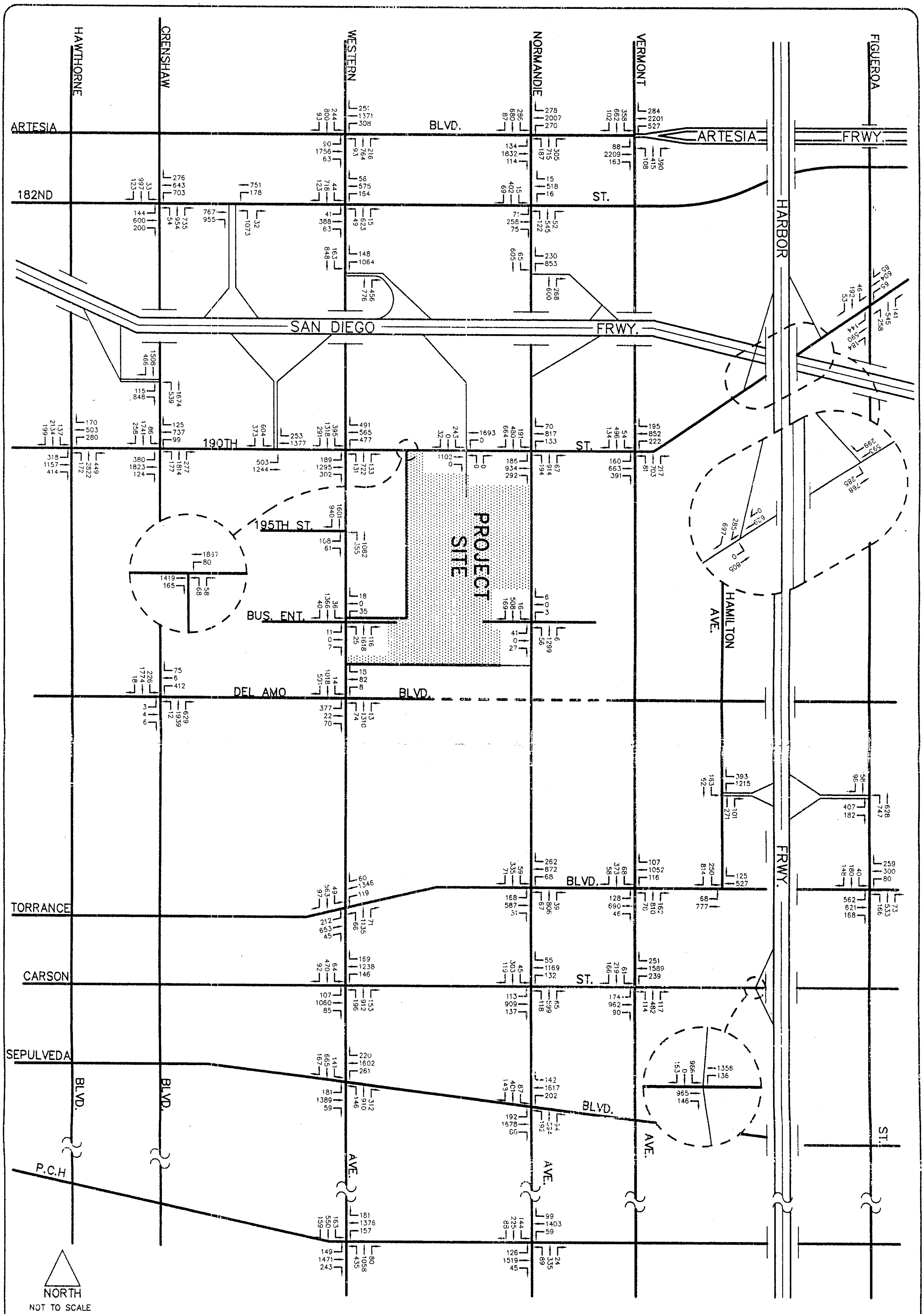

FIGURE 6(a)

10/22/1996

FN: MCDONNEL\AM2006WO

FUTURE (2006) TRAFFIC VOLUMES
WITHOUT PROJECT
AM PEAK HOUR

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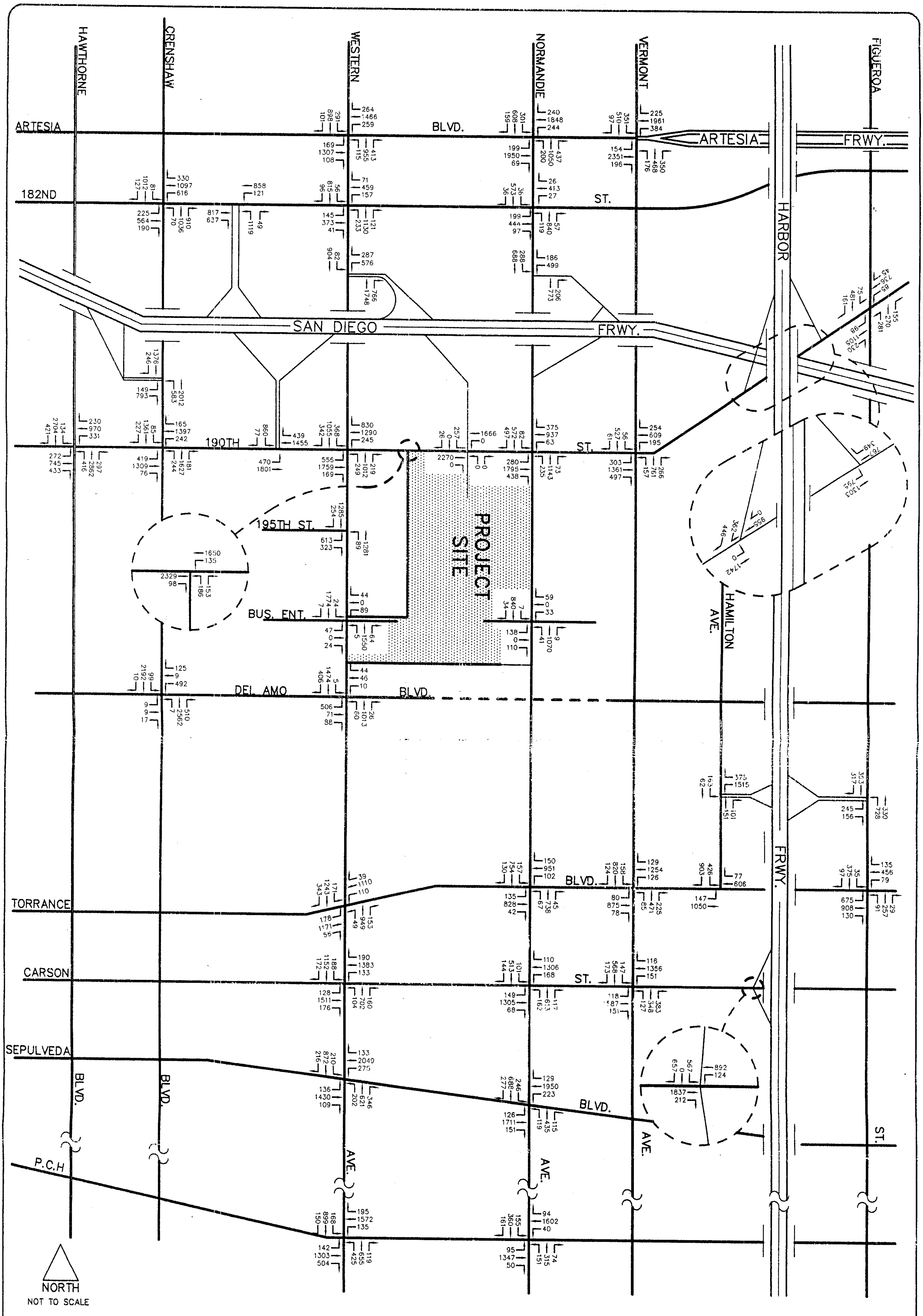

FIGURE 6(b)

10/22/1996

FN: MCDONNEL\PM2006WO

FUTURE (2006) TRAFFIC VOLUMES
WITHOUT PROJECT
PM PEAK HOUR

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on the street system. Future (2006) AM and PM peak hour traffic volumes with the proposed project traffic are shown in Figures 7(a) and (b), respectively.

Analysis of Future Traffic Conditions (With and Without Project)

The analysis of future conditions in the study area was performed using the same Critical Movement Analysis procedures described previously in this report. The results of the Critical Movement Analysis for future traffic conditions at the study intersections are summarized in Table 8. The table shows that at a majority of the study intersections future traffic conditions will likely be at low levels of congestion with and without the proposed project.

As determined by LADOT, a "significant traffic impact" attributable to a project can occur within three ranges of CMA values as follows:

Criteria for Significant Traffic Impact

Final CMA Value	Project-Related Increase in CMA Value
0.700 - 8.00	equal to or greater than 0.040
0.800 - 0.900	equal to or greater than 0.020
0.900 or greater	equal to or greater than 0.010

As indicated in Table 8, the proposed project, prior to any mitigation, could have significant traffic impacts at thirty intersections during the morning and/or evening peak hours.

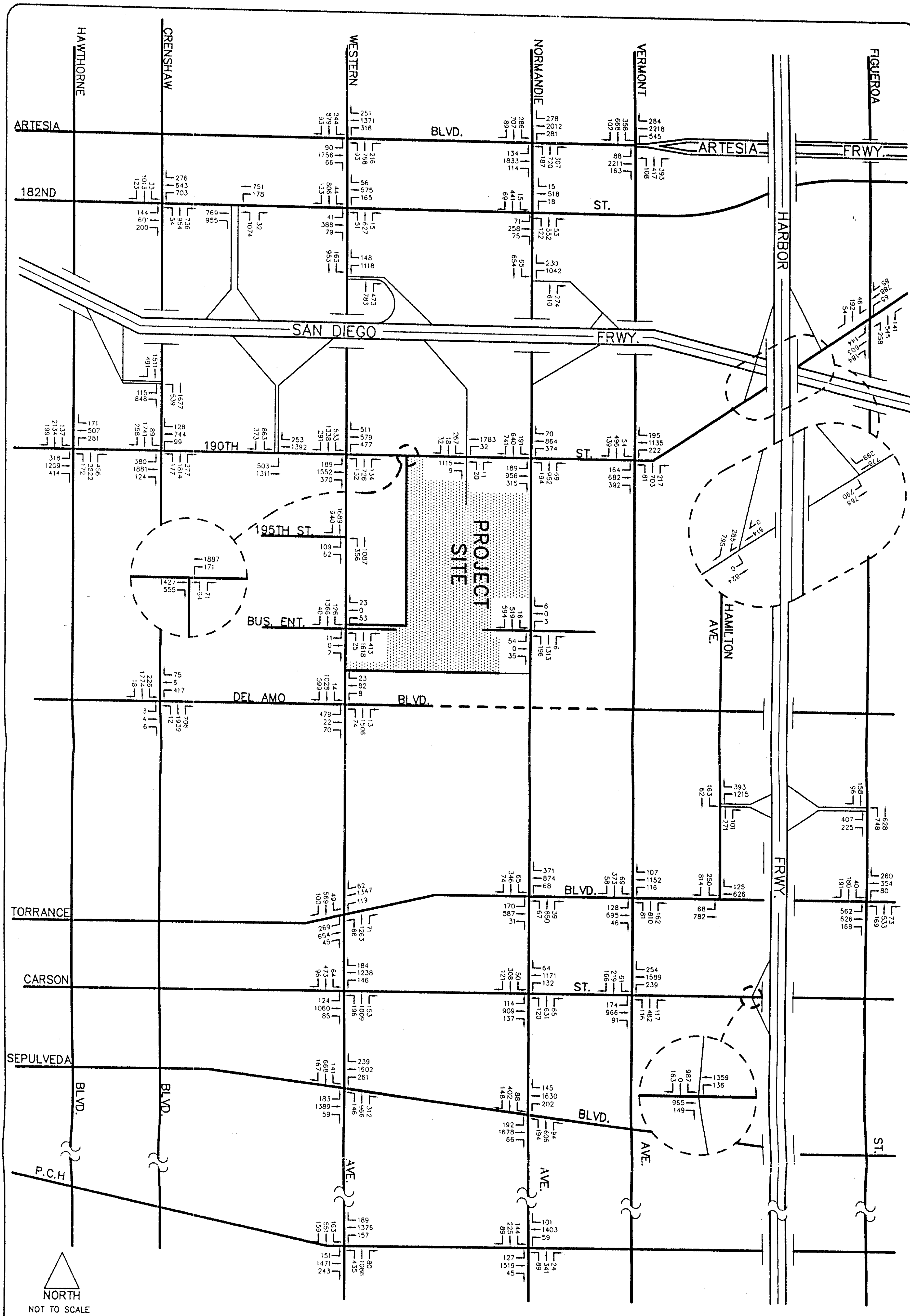

FIGURE 7(a)

10/22/1996

FN: MCDONNEL\AM2006WP

FUTURE (2006) TRAFFIC VOLUMES
WITH PROJECT
AM PEAK HOUR

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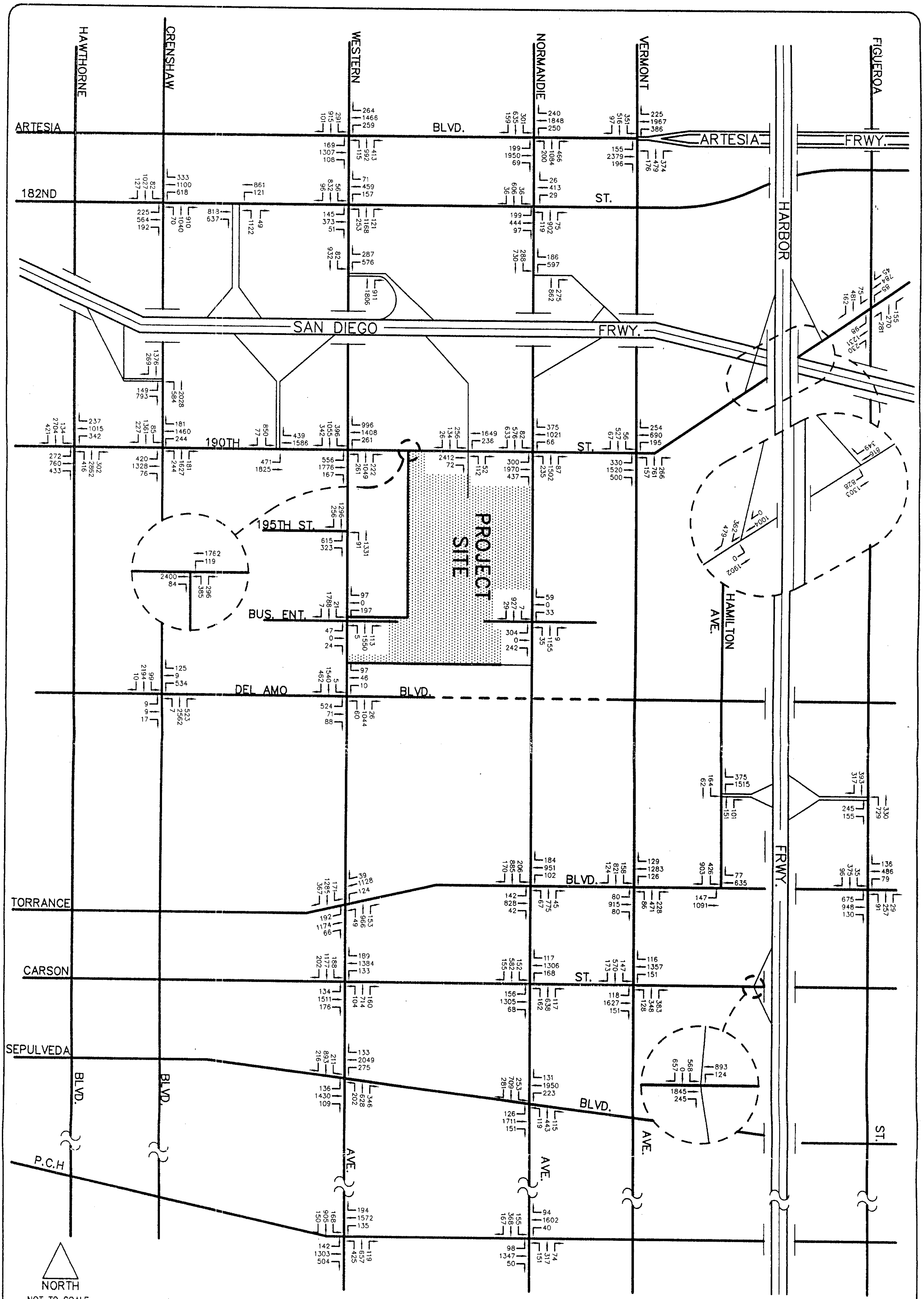

FIGURE 7(b)

10/22/1996

FN: MCDONNEL\PM2006WP

FUTURE (2006) TRAFFIC VOLUMES WITH PROJECT PM PEAK HOUR

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Table 8
Critical Movement Analysis Summary
Future (Year 2006) Traffic Conditions

No.	Intersection	Peak Period	Without Project CMA	Without Project LOS	With Project Without Mitigation CMA	With Project Without Mitigation LOS	With Project Without Mitigation IMPACT
1.	Hawthorne Blvd. and 190th St.	AM	1.100	F	1.120	F	0.020*
		PM	1.120	F	1.137	F	0.017*
2.	Crenshaw Blvd. and 182nd St.	AM	1.018	F	1.018	F	0.000
		PM	1.186	F	1.190	F	0.004
3.	Crenshaw Blvd. and San Diego Fwy. S/B on/off-ramps	AM	1.083	F	1.089	F	0.006
		PM	1.017	F	1.022	F	0.005
4.	Crenshaw Blvd. and 190th St.	AM	1.348	F	1.369	F	0.021*
		PM	1.375	F	1.399	F	0.024*
5.	Crenshaw Blvd. and Del Amo Blvd.	AM	0.939	E	0.959	E	0.020*
		PM	1.002	F	1.020	F	0.018*
6.	San Diego Fwy. N/B on/off-ramps and 182nd St.	AM	0.998	E	1.000	E	0.002
		PM	0.955	E	0.957	E	0.002
7.	Western Ave. and Artesia Blvd.	AM	1.120	F	1.128	F	0.008
		PM	1.102	F	1.115	F	0.013*
8.	Western Ave. and 182nd St.	AM	0.503	A	0.539	A	0.036
		PM	0.663	B	0.681	B	0.018
9.	Western Ave. and San Diego Fwy. N/B on/off-ramps	AM	0.701	C	0.722	C	0.021
		PM	0.855	D	0.875	D	0.020*
10.	San Diego Fwy. S/B on/off-ramps	AM	1.178	F	1.275	F	0.097*
		PM	1.169	F	1.213	F	0.044*
11.	Western Ave. and 190th St.	AM	0.877	D	0.945	E	0.068*
		PM	1.128	F	1.265	F	0.137*
12.	Western Ave. and 195th St.	AM	0.939	E	1.009	F	0.070*
		PM	0.820	D	0.825	D	0.005
13.	Western Ave. and Project Dwy.	AM	0.463	A	0.608	B	0.145
		PM	0.516	A	0.594	A	0.078
14.	Western Ave. and Del Amo Blvd.	AM	0.821	D	0.954	E	0.133*
		PM	0.863	D	0.902	E	0.039*
15.	Western Ave. and Torrance Blvd.	AM	0.851	D	0.936	E	0.085*
		PM	0.821	D	0.842	E	0.021*
16.	Western Ave. and Carson St.	AM	0.817	D	0.865	D	0.048*
		PM	1.035	F	1.043	F	0.008

* Denotes significant impact

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Table 8 (cont.)
Critical Movement Analysis Summary
Future (Year 2006) Traffic Conditions

No.	Intersection	Peak Period	Without Project CMA	Without Project LOS	With Project Without Mitigation CMA	With Project Without Mitigation LOS	With Project Without Mitigation IMPACT
17.	Western Ave. and Sepulveda Blvd.	AM	1.050	F	1.077	F	0.027*
		PM	1.100	F	1.107	F	0.007
18.	Western Ave. and Pacific Coast Hwy.	AM	0.992	E	1.002	F	0.010*
		PM	1.017	F	1.020	F	0.003
19.	Project Dwy. and 190th St.	AM	0.692	B	0.831	D	0.139*
		PM	1.023	F	1.164	F	0.141*
20.	Artesia Blvd. and Normandie Ave.	AM	0.937	E	0.940	E	0.003
		PM	1.065	F	1.081	F	0.016*
21.	Normandie Ave. and 182nd St.	AM	0.463	A	0.476	A	0.013
		PM	0.602	B	0.629	B	0.027
22.	Normandie Ave. and San Diego Fwy. N/B on/off-ramps	AM	0.694	B	0.762	C	0.068*
		PM	0.747	C	0.832	D	0.085*
23.	San Diego Fwy. off-ramp and 190th St.	AM	0.820	D	0.778	C	- 0.042
		PM	1.064	F	1.007	F	- 0.057
24.	Normandie Ave. and 190th St.	AM	0.969	E	1.141	F	0.172*
		PM	1.246	F	1.431	F	0.185*
25.	Normandie Ave. and Project Dwy./ Francisco St.	AM	0.493	A	0.560	A	0.067
		PM	0.552	A	0.779	C	0.227*
26.	Normandie Ave. and Torrance Blvd.	AM	0.811	D	0.867	D	0.056*
		PM	0.823	D	0.884	D	0.061*
27.	Normandie Ave. and Carson St.	AM	0.716	C	0.732	C	0.016
		PM	0.896	D	0.923	E	0.027*
28.	Normandie Ave. and Sepulveda Blvd.	AM	0.782	C	0.788	C	0.006
		PM	0.888	D	0.896	D	0.008
29.	Normandie Ave. and Pacific Coast Hwy.	AM	0.564	A	0.566	A	0.002
		PM	0.644	B	0.651	B	0.007
30.	Vermont Ave. and Artesia Blvd.	AM	0.969	E	0.979	E	0.010*
		PM	0.930	E	0.937	E	0.007
31.	Vermont Ave. and 190th St.	AM	0.886	D	0.942	E	0.056*
		PM	1.189	F	1.246	F	0.057*
32.	Vermont Ave. and Torrance Blvd.	AM	0.841	D	0.875	D	0.034*
		PM	0.886	D	0.896	D	0.010

* Denotes significant impact

Table 8 (cont.)
Critical Movement Analysis Summary
Future Traffic Conditions

No.	Intersection	Peak Period	Without Project CMA	Without Project LOS	With Project Without Mitigation CMA	With Project Without Mitigation LOS	With Project Without Mitigation IMPACT
33.	Vermont Ave. and Carson St.	AM	0.847	D	0.847	D	0.000
		PM	0.933	E	0.946	E	0.013*
34.	Harbor Fwy. S/B off-ramp and 190th St.	AM	0.703	C	0.803	D	0.100*
		PM	0.822	D	0.875	D	0.053*
35.	Harbor Fwy. N/B on-ramp and 190th St.	AM	0.487	A	0.566	A	0.079
		PM	0.983	E	1.030	F	0.047*
36.	Figueroa St. and 190th St.	AM	0.551	A	0.613	B	0.062
		PM	0.826	D	0.869	D	0.043*
37.	Hamilton Ave. and Harbor Fwy. S/B on/off-ramps	AM	0.735	C	0.735	C	0.000
		PM	0.765	C	0.765	C	0.000
38.	Figueroa St. and Harbor Fwy. N/B on/off-ramps	AM	0.779	C	0.794	C	0.015
		PM	0.855	D	0.856	D	0.001
39.	Hamilton Ave. and Torrance Blvd.	AM	0.917	E	0.983	E	0.066*
		PM	1.055	F	1.074	F	0.019*
40.	Figueroa St. and Torrance Blvd.	AM	0.851	D	0.866	D	0.015
		PM	1.013	F	1.041	F	0.028*
41.	Harbor Fwy. S/B on/off-ramps and Carson St.	AM	1.168	F	1.170	F	0.002
		PM	0.964	E	0.975	E	0.011*

* Denotes significant impact

The Level of Service values used for freeway segment analyses are estimated by calculating the demand-to-capacity (D/C) ratio and using the LOS definitions shown in Table 9. The peak hour volumes shown in Table 10 were compared to freeway capacities, based on 2,000 vehicles per hour per lane (VPHPL) and 1,500 VPHPL for HOV lanes, in order to determine the demand-to-capacity ratio (D/C) and corresponding Level of Service. The results of this comparison are shown in Table 11.

Table 9
Freeway Mainline Level of Service Definitions

D/C Ratio	LOS	D/C Ratio	LOS*
0.00 - 0.35	A	>1.00 - 1.25	F(0)
>0.35 - 0-.54	B	> 1.25 - 1.35	F(1)
>0.54 - 0.77	C	>1.35 - 1.45	F(2)
>0.77 - 0.93	D	>1.45	F(3)
>0.93 - 1.00	E		

* LOS F(1) through F(3) represent severe congestion (travel speeds less than 25 MPH) for more than one hour.

Source: Los Angeles County Metropolitan transportation Authority, Congestion Management Program, 1993.

As Table 11 shows, the area freeway system will be heavily congested with or without the project. The project will add incrementally to these insignificant cumulative impacts. The project will have significant impacts at up to four locations during the morning peak hour and in the opposite direction at the same four locations in the PM peak hour. These will be addressed by the overall Congestion Management Program (CMP) improvements, such as those included in the mitigation section of this report.

Table 10

Existing and Future

Peak Hour Freeway Traffic Volumes

CMP Station	Direction	Peak Hour	Existing Volume	Future Without Project Volume	Future With Project Volume
I-405 Freeway:					
Santa Fe Ave. (1064)	N/B	AM	7,386	7,571	7,810
		PM	6,003	6,397	6,475
	S/B	AM	7,866	8,063	8,092
		PM	10,475	10,737	10,888
North of Carson St. (1065)	N/B	AM	8,093	8,295	8,556
		PM	7,792	8,362	8,461
	S/B	AM	7,055	7,564	7,616
		PM	11,174	11,453	11,687
Marine Ave. (1066)	N/B	AM	9,024	9,331	9,371
		PM	10,352	11,033	11,233
	S/B	AM	7,638	7,829	8,044
		PM	11,995	12,295	12,365
I-110 Freeway:					
South of "C" St. (1044)	N/B	AM	4,293	4,576	4,627
		PM	2,710	2,998	3,017
	S/B	AM	2,786	3,097	3,108
		PM	4,258	4,723	4,776
South of Manchester Blvd. (1045)	N/B	AM	11,995	13,076	13,065
		PM	8,262	9,322	9,408
	S/B	AM	7,820	9,926	10,026
		PM	7,886	10,232	10,270
SR-91 Freeway:					
East of Alameda St. (1035)	E/B	AM	8,824	10,301	10,339
		PM	16,761	18,346	18,546
	W/B	AM	15,528	16,924	17,176
		PM	8,839	10,151	10,221
East of Cherry Ave. (1036)	E/B	AM	8,899	9,121	9,139
		PM	14,070	14,422	14,518
	W/B	AM	12,940	13,263	13,390
		PM	9,114	9,342	9,370

Table 11
Project Freeway Impacts
Existing and Future Levels of Service

CMP Station	Direction	Peak Hour	Existing V/C	Existing LOS	Future Without Project V/C	Future Without Project LOS	Future With Project V/C	Future With Project LOS	Future With Project Impact
I-405 Freeway:									
Santa Fe Ave. (1064)	N/B	AM	0.923	D	0.946	E	0.976	E	0.030
		PM	0.750	C	0.800	D	0.809	D	0.009
	S/B	AM	0.983	E	1.008	F(0)	1.011	F(0)	0.003
		PM	1.309	F(1)	1.342	F(1)	1.361	F(2)	0.019
North of Carson St. (1065)	N/B	AM	1.012	F(0)	1.037	F(0)	1.070	F(0)	0.033*
		PM	0.974	E	1.045	F(0)	1.058	F(0)	0.013
	S/B	AM	0.882	D	0.946	E	0.952	E	0.006
		PM	1.397	F(2)	1.432	F(2)	1.461	F(3)	0.029*
Marine Ave. (1066)	N/B	AM	1.128	F(0)	1.166	F(0)	1.171	F(0)	0.005
		PM	1.294	F(1)	1.379	F(2)	1.404	F(2)	0.025*
	S/B	AM	0.955	E	0.979	E	1.005	F(0)	0.026*
		PM	1.499	F(3)	1.537	F(3)	1.546	F(3)	0.009
I-110 Freeway:									
South of "C" St. (1044)	N/B	AM	0.537	B	0.572	C	0.578	C	0.006
		PM	0.339	A	0.375	B	0.377	B	0.002
	S/B	AM	0.348	A	0.387	B	0.388	B	0.001
		PM	0.532	B	0.590	C	0.597	C	0.007
South of Manchester Blvd. (1045)	N/B	AM	1.499	F(3)	1.631	F(3)	1.633	F(3)	0.002
		PM	1.033	F(0)	1.165	F(0)	1.176	F(0)	0.011
	S/B	AM	0.978	E	1.241	F(0)	1.253	F(1)	0.012
		PM	0.986	E	1.279	F(1)	1.284	F(1)	0.005
SR-91 Freeway:									
East of Alameda St. (1035)	E/B	AM	0.735	C	0.858	D	0.862	D	0.004
		PM	1.397	F(2)	1.529	F(3)	1.546	F(3)	0.017
	W/B	AM	1.294	F(1)	1.410	F(2)	1.431	F(2)	0.021*
		PM	0.737	C	0.846	D	0.852	D	0.006
East of Cherry Ave. (1036)	E/B	AM	0.890	D	0.912	D	0.914	D	0.002
		PM	1.407	F(2)	1.442	F(2)	1.452	F(3)	0.010
	W/B	AM	1.294	F(1)	1.326	F(1)	1.339	F(1)	0.013
		PM	0.911	D	0.934	E	0.937	E	0.003

* Denotes significant project impact.

It should be noted that congestion on the mainline will as affect conditions on the area on-ramps. Unmetered ramps form inefficient merge or weave sections when the mainline speeds drop below the point where the on-ramp traffic can easily find gaps. Ramp metering, by spreading out the "pulses" from adjacent signals, can improve the capacity of the ramp to a limited degree. However, if the mainline of the freeway is operating under forced flow conditions, back-ups from the mainline will extend on to ramps. While these adverse impacts occur on the ramp, they are a result of mainline congestion and, thus, no separate ramp capacity analysis would be meaningful.

MITIGATION MEASURES

As required by the Department of Transportation (LADOT), the project must submit a Traffic Mitigation Plan (TMP) to reduce the project's significant traffic impacts to non-significant levels. In selecting the project's traffic mitigating measures, the City's top priority is reducing trip demand by single occupancy vehicles and promoting transit use. To achieve this trip reduction goal, the City has prioritized mitigation measures by category as listed below:

1. Transportation Demand Management (TDM) Programs;
2. Transit Capacity and Access Improvements;
3. Traffic Signal Operation Improvements (ATSAC);
4. Street Widening and Other Physical Improvements; and
5. Street Restriping and Parking Prohibitions.

The project's proposed TMP includes mitigation measures in several of the categories listed above. The recommended mitigation measures are:

Category 1 - TDM Programs

- o <u>Compliance with Ordinance No. 168,700 (Transportation Demand Management and Trip Reduction Measures)</u>. This ordinance focuses on incorporating TDM facilities into the design of new buildings to promote alternative modes of transportation (see Appendix B). It should be followed in the design and construction of the project site and buildings.

- o <u>Compliance with SCAQMD Rule 2202</u>. The South Coast Air Quality Management District (SCAQMD) has adopted a rule designed to reduce the air pollution impacts of commute trips. This rule, unlike the rule it replaces, does not mandate trip reduction programs but allows individual employers to select from a variety of options. However, most employers have continued to select ridesharing programs as the most cost-effective method of reducing air quality impacts. If site employers implement these trip reduction measures, 15 percent or more of the peak hour traffic generation from the industrial/office park component of the project could be eliminated.

Category 2 - Transit Improvements

- o Bus Transit Improvements. This project should work with the appropriate transit districts (i.e., Gardena Transit, Torrance Transit and MTA) to improve transit service to the site. Further, the sidewalks through the sites should be designed to provide attractive pedestrian routes to and from transit stops.

Categories 3, 4 and 5 - Signal System Improvements, Street Widenings and Restriping, and Parking Restrictions

- o 1. Hawthorne Boulevard and 190th Street -- Restripe 190th Street and restrict parking to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes. Modify the signal to remove the existing eastbound right-turn phase.

- o 4. Crenshaw Boulevard and 190th Street -- Remove median islands, restripe and restrict parking along 190th Street to convert the existing eastbound and westbound right-turn-only lanes to through/right optional lanes.

- o 5. Crenshaw Boulevard and Del Amo Boulevard -- Restripe Del Amo Boulevard and modify the traffic signal to provide two left-turn-only lanes, a through/left optional lane and a right-turn-only lane in the westbound direction.

- 7. <u>Western Avenue and Artesia Boulevard</u> -- Restripe Western Avenue and restrict parking to convert the existing northbound and southbound right-turn-only lanes to through/right optional lanes.

- 9. <u>Western Avenue and I-405 Freeway Northbound On/Off-Ramps</u> -- Widen and/or modify the median island and restripe the westbound approach to the intersection (i.e., the off-ramp) to provide two left-turn-only lanes and a right-turn-only lane instead of the existing two-lane configuration.

- 10. <u>I-405 Freeway Southbound On/Off-Ramps and 190th Street</u> -- Flare the west leg of the intersection, restripe 190th Street, restrict parking and modify the signal to provide dual left-turn lanes in the eastbound direction.

- 11. <u>Western Avenue and 190th Street</u> -- Any mitigation would require a reduction below 11 foot interior lane widths on a high speed state facility and/or aquisition of right-of-way. Therefore, no feasible mitigation is available.

- 12. <u>Western Avenue and 195th Street</u> -- Fund the installation of the Automated Traffic Surveillance and Control (ATSAC) system at this location.

- 14. <u>Western Avenue and Del Amo Boulevard</u> -- Restripe the eastbound approach to convert the through lane to through/left optional lane and provide east-west opposed phasing. Remove the crosswalk on the north leg. Also fund the installation of ATSAC at this location.

- 15. <u>Western Avenue and Torrance Boulevard</u> -- Any mitigation would require removal of parking, narrowing of the median containing the railroad tracks or aquisition of additional right-of-way, none of which is considered feasible. Therefore, no mitigation is available.

- 16. Western Avenue and Carson Street -- Mitigation of this impact would require removal of parking on Carson Street, for which there is a heavy demand. Therefore, no mitigation is available.
- 17. Western Avenue and Sepulveda Boulevard -- Restrict parking to provide right-turn-only lanes in the northbound and southbound directions.
- 18. Western Avenue and Pacific Coast Highway -- Installation of mitigation would require interior lane width of less than 11 feet on a high speed state facility or an offsetting of lanes across the intersection. Therefore, no mitigation is available.
- 19. Project Roadway and 190th Street -- Restrict parking and restripe 190th Street to provide three travel lanes plus left-turn channelization in the westbound and eastbound directions and three travel lanes in the eastbound direction. Construct the internal project roadway to provide a three-lane northbound approach including two left-turn-only lanes and a right-turn-only lane. Fund the installation of ATSAC at this intersection.
- 20. Normandie Avenue and Artesia Boulevard -- Provide dual left-turn lanes in the southbound direction by restriping Normandie Avenue and modifying the signal.
- 22. Normandie Avenue and I-405 Freeway Northbound On/Off-Ramps -- Widen and restripe the northbound approach to provide two through lanes and an exclusive right-turn-only lane to facilitate freeway access. Fund ATSAC installation at this location.
- 23. I-405 Freeway Southbound Off-Ramp/Project Driveway and 190th Street -- Flare and restripe 190th Street to provide three travel lanes and dual left-turn lanes in the westbound direction and three travel lanes and a "pre-left-

turn-lane" for Normandie Avenue in the eastbound direction. Construct the project driveway to provide dual left-turn lanes and a right-turn-only lane in the northbound direction. Install a signal with opposed northbound and southbound phasing. Fund ATSAC installation at this location.

Should an LADOT review of operations at this intersection indicate that left-turns to or from the driveway would unacceptably interfere with the ability to coordinate this signal and the signal at 190th Street and Normandie Avenue, one or more turning movements could be restricted.

- o 24. Normandie Avenue and 190th Street -- Modify the signal and railroad crossing equipment on 190th Street to provide dual left-turn-only lanes plus three travel lanes in the eastbound and westbound directions. Modify the signal equipment to provide a southbound right-turn overlap phase. Additionally, fund the installation of ATSAC at this location.

- o 25. Normandie Avenue and Project Roadway/Francisco Street -- Construct the project roadway to provide a three-lane eastbound approach including a left-turn-only lane, a through/left optional lane and a right-turn-only lane. Modify the signal to provide opposed phasing the eastbound and westbound directions.

- o 26. Normandie Avenue and Torrance Boulevard -- Fund the installation of ATSAC at this intersection.

- o 27. Normandie Avenue and Carson Street -- Fund the installation of ATSAC at this intersection.

- o 30. Vermont Avenue and Artesia Boulevard -- Flare and restripe Vermont Avenue and modify the signal equipment to provide dual left-turn lanes, two through lanes and a right-turn-only lane in the northbound direction. Provide a northbound right-turn phase overlapping the existing westbound left-turn phase as part of the signal modifications.

- 31. Vermont Avenue and 190th Street -- Restripe 190th Street to provide three through lanes in the eastbound and westbound directions. Fund the installation of ATSAC at this intersection.

- 32. Vermont Avenue and Torrance Boulevard -- Restrict parking and restripe Vermont Avenue to provide a right-turn-only lane in the northbound and southbound directions.

- 33. Vermont Avenue and Carson Street -- Restrict parking and restripe Vermont Avenue to convert the existing eastbound right-turn-only lane into a through/right optional lane.

- 34. I-110 Freeway Southbound Off-Ramp and 190th Street -- Restripe 190th Street to provide three travel lanes in the westbound direction. Modify the signal to provide a southbound right-turn phase extension concurrent with the initiation of the eastbound through phase. Fund the installation of ATSAC at this intersection.

- 35. I-110 Freeway Northbound On-Ramp and 190th Street -- Install a traffic signal at this location. Modify the median island, restrict parking and restripe 190th Street to provide dual eastbound left-turn lanes including an HOV lane.

- 36. Figueroa Street and 190th Street -- Restrict parking and restripe Figueroa Street to provide a southbound right-turn-only lane.

- 39. Hamilton Avenue and Torrance Boulevard -- Restripe Hamilton Avenue to provide a left/right optional lane and a right-turn-only lane.

- 40. Figueroa Street and Torrance Boulevard -- Remove the sidewalk along the south curb, restrict parking and restripe Torrance Boulevard to provide a left-turn-only lane, a through/left optional lane, and through/right optional lane in the eastbound direction. Modify the signal to provide opposed east-west phasing.

- 41. Harbor Freeway Southbound On-Off Ramps and Carson Street -- Restripe Carson Street to provide a right-turn-only lane in the eastbound direction.

Table 12 summarizes the CMA values at the significantly impacted intersections with the physical (Categories 3, 4 and 5) mitigating measures listed above. It does not, however, consider the trip reduction benefits of the Category 1 and 2 measures.

As this table shows, while the Harbor Gateway Center multi-use development will add to the cumulative traffic flow in the study area, it will be able to reduce significant impacts upon traffic conditions at most locations once the proposed traffic mitigating measures are installed. Significant traffic impacts could remain, however, at four intersections and on area freeways. Cumulative programs, such as regional transit system improvements, ridesharing requirements, and regional roadway capacity enhancements will mitigate these remaining impacts to some degree.

It should be noted that many of these improvements are outside the control of the City of Los Angeles and the project proponent. Should any of these measures be rejected by another jurisdiction with control over the intersection, and should an appropriate alternative mitigation measure not be identified, then additional significant traffic impacts could remain.

Table 12
Critical Movement Analysis Summary
Future (Year 2006) Traffic Conditions
With Project Mitigation

No.	Intersection	Peak Period	Without Project CMA	Without Project LOS	With Project With Mitigation CMA	With Project With Mitigation LOS	IMPACT
1.	Hawthorne Blvd. and 190th St.	AM	1.100	F	1.074	F	- 0.026
		PM	1.120	F	1.071	F	- 0.049
4.	Crenshaw Blvd. and 190th St.	AM	1.348	F	1.171	F	- 0.177
		PM	1.375	F	1.265	F	- 0.110
5.	Crenshaw Blvd. and Del Amo Blvd.	AM	0.939	E	0.921	E	- 0.018
		PM	1.002	F	0.971	E	- 0.031
7.	Western Ave. and Artesia Blvd.	AM	1.120	F	1.087	F	- 0.033
		PM	1.102	F	1.095	F	- 0.007
9.	Western Ave. and San Diego Fwy. N/B on/off-ramps	AM	0.701	C	0.710	C	+ 0.009
		PM	0.855	D	0.798	C	- 0.057
10.	San Diego Fwy. S/B on/off-ramps	AM	1.178	F	1.116	F	- 0.062
		PM	1.169	F	1.064	F	- 0.105
11.	Western Ave. and 190th St.	AM	0.877	D	0.945	E	+ 0.068*
		PM	1.128	F	1.265	F	+ 0.137*
12.	Western Ave. and 195th St.	AM	0.939	E	0.939	E	+ 0.000
		PM	0.820	D	0.755	C	- 0.065
14.	Western Ave. and Del Amo Blvd.	AM	0.821	D	0.774	C	- 0.047
		PM	0.863	D	0.721	C	- 0.142
15.	Western Ave. and Torrance Blvd.	AM	0.851	D	0.936	E	+ 0.085*
		PM	0.821	D	0.842	D	+ 0.021*
16.	Western Ave. and Carson St.	AM	0.817	D	0.865	D	+ 0.048*
		PM	1.035	F	1.043	F	+ 0.008
17.	Western Ave. and Sepulveda Blvd.	AM	1.050	F	0.963	E	- 0.087
		PM	1.100	F	1.029	F	- 0.071
18.	Western Ave. and Pacific Coast Hwy.	AM	0.992	E	1.002	F	+ 0.010*
		PM	1.017	F	1.020	F	+ 0.003
19.	Project Dwy. and 190th St.	AM	0.692	B	0.543	A	- 0.149
		PM	1.023	F	0.760	C	- 0.263
20.	Artesia Blvd. and Normandie Ave.	AM	0.937	E	0.895	D	- 0.042
		PM	1.065	F	0.983	E	- 0.082
22.	Normandie Ave. and San Diego Fwy. N/B on/off-ramps	AM	0.694	B	0.601	B	- 0.093
		PM	0.747	C	0.671	B	- 0.076

* Denotes significant impact

Table 12 (cont.)
Critical Movement Analysis Summary
Future (Year 2006) Traffic Conditions
With Project Mitigation

No.	Intersection	Peak Period	Without Project CMA	Without Project LOS	With Project With Mitigation CMA	With Project With Mitigation LOS	IMPACT
23.	San Diego Fwy. off-ramp and 190th St.	AM	0.820	D	0.485	A	- 0.335
		PM	1.064	F	0.673	B	- 0.391
24.	Normandie Ave. and 190th St.	AM	0.969	E	0.955	E	- 0.014
		PM	1.246	F	1.133	F	- 0.113
25.	Normandie Ave. and Project Dwy./ Francisco St.	AM	0.493	A	0.570	A	+ 0.077
		PM	0.552	A	0.608	B	+ 0.056
26.	Normandie Ave. and Torrance Blvd.	AM	0.811	D	0.797	C	- 0.014
		PM	0.823	D	0.814	D	- 0.009
27.	Normandie Ave. and Carson St.	AM	0.716	C	0.662	B	- 0.054
		PM	0.896	D	0.853	D	- 0.043
30.	Vermont Ave. and Artesia Blvd.	AM	0.969	E	0.943	E	- 0.026
		PM	0.930	E	0.902	E	- 0.028
31.	Vermont Ave. and 190th St.	AM	0.886	D	0.717	C	- 0.169
		PM	1.189	F	0.939	E	- 0.250
32.	Vermont Ave. and Torrance Blvd.	AM	0.841	D	0.821	D	- 0.020
		PM	0.886	D	0.855	D	- 0.031
33.	Vermont Ave. and Carson St.	AM	0.847	D	0.847	D	+ 0.000
		PM	0.933	E	0.816	D	- 0.117
34.	Harbor Fwy. S/B off-ramp and 190th St.	AM	0.703	C	0.641	B	- 0.062
		PM	0.822	D	0.805	D	- 0.017
35.	Harbor Fwy. N/B on-ramp and 190th St.	AM	0.487	A	0.366	A	- 0.121
		PM	0.983	D	0.575	A	- 0.408
36.	Figueroa St. and 190th St.	AM	0.551	A	0.595	A	+ 0.044
		PM	0.826	D	0.815	D	- 0.011
39.	Hamilton Ave. and Torrance Blvd.	AM	0.917	E	0.806	D	- 0.111
		PM	1.055	F	0.940	E	- 0.115
40.	Figueroa St. and Torrance Blvd.	AM	0.851	D	0.785	C	- 0.066
		PM	1.013	F	0.858	D	- 0.155
41.	I-110 S/B On/Off Ramps and Carson St.	AM	1.168	F	1.170	F	+ 0.002
		PM	0.964	E	0.878	D	- 0.086

* Denotes significant impact

APPENDIX A

TRAFFIC IMPACTS OF PHASE I PROJECT

APPENDIX A

Traffic Generation of Phase 1 Project

Phase I

Land Use Category	Size (Sq. Ft.)	Daily Traffic	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Shopping Center Gross Generation								
Retail*	385,000	15,010	212	125	337	712	711	1,423
Theater, 4,000 seats	65,000	1,930	76	44	120	154	86	240
Subtotal	450,000	16,940	288	169	457	866	797	1,663
Less Shopping Center Internal/Pass-By Trips								
Retail (1%/20%)		(3,000)	(42)	(25)	(67)	(142)	(142)	(284)
Theater (10%/10%)		(390)	(15)	(9)	(24)	(31)	(17)	(48)
Subtotal		(3,390)	(57)	(34)	(91)	(173)	(159)	(332)
Site Generation	450,000	13,550	231	135	366	693	638	1,331
Less Existing Site Generation Warehouse**	(600,000)	(2,120)	(151)	(59)	(210)	(96)	(178)	(274)
Net Site Generation Increase	(150,000)	11,430	80	76	156	597	460	1,057

* Rate for 450,000 sq. ft. Shopping Center used.
** Rate for 2.4 million sq. ft. Warehouse used. Building area removal based on acreage of phase.

Crain & Associates
August 29, 1996
DRAFT

Year 1998 Project Traffic Conditions
A.M. Peak Hour

No	Intersection	-- Future (1998) Conditions -- W/O Project CMA	LOS	With Phase 1 Proj. CMA	LOS	Impact
1	Hawthorne Bl. and 190th St.	1.054	F	1.060	F	0.006
2	Crenshaw Bl. and 182nd St.	1.095	F	1.096	F	0.001
3	Crenshaw Bl. and I-405 SB On/Off Ramps	0.934	E	0.940	E	0.006
4	Crenshaw Bl. and 190th St.	1.277	F	1.287	F	0.010
5	Crenshaw Bl. and Del Amo Bl.	0.903	E	0.910	E	0.007
6	I-405 NB On/Off Ramps and 182nd St.	0.891	D	0.892	D	0.001
7	Western Ave. and Artesia Bl.	1.021	F	1.025	F	0.004
8	Western Ave. and 182nd St.	0.643	B	0.656	B	0.013
9	Western Ave. and I-405 NB On/Off Ramps	0.773	C	0.780	C	0.007
10	I-405 SB On/Off Ramps and 190th St.	1.049	F	1.069	F	0.020
11	Western Ave. and 190th St.	1.005	F	1.026	F	0.021
12	Western Ave. and 195th St.	0.402	A	0.407	A	0.005
13	Western Ave. and Project Driveway	0.478	A	0.486	A	0.008
14	Western Ave. and Del Amo Bl.	0.805	D	0.823	D	0.018
15	Western Ave. and Torrance Bl.	0.764	C	0.787	C	0.023
16	Western Ave. and Carson St.	1.039	F	1.042	F	0.003
17	Western Ave. and Sepulveda Bl.	1.103	F	1.105	F	0.002
18	Western Ave. and Pacific Coast Highway	1.014	F	1.015	F	0.001
19	Project Driveway and 190th St.	0.965	E	0.947	E	-0.018
20	Artesia Bl. and Normandie Ave.	1.020	F	1.031	F	0.011
21	Normandie Ave. and 182nd St.	0.532	A	0.547	A	0.015
22	Normandie Ave. and I-405 NB On-Off Ramp	0.614	B	0.688	B	0.074
23	I-405 SB Off Ramp and 190th St.	0.918	E	1.007	F	0.089
24	Normandie Ave. and 190th St.	1.057	F	1.147	F	0.090
25	Normandie Ave. and Project Driveway/Fra	0.506	A	0.535	A	0.029
26	Normandie Ave. and Torrance Bl.	0.659	B	0.700	B	0.041
27	Normandie Ave. and Carson St.	0.834	D	0.845	D	0.011
28	Sepulveda Bl. and Normandie Ave.	0.795	C	0.799	C	0.004
29	Pacific Coast Hwy. and Normandie Ave.	0.581	A	0.585	A	0.004
30	Vermont Ave. and Artesia Bl.	0.894	D	0.899	D	0.005
31	Vermont Ave. and 190th St.	1.074	F	1.092	F	0.018
32	Vermont Ave. and Torrance Bl.	0.753	C	0.759	C	0.006
33	Vermont Ave. and Carson St.	0.871	D	0.873	D	0.002
34	I-110 SB Off Ramp and 190th St.	0.799	C	0.815	D	0.016
35	I-110 NB on Ramp and 190th St.	0.939	E	0.967	E	0.028
36	Figueroa St. and 190th St.	0.771	C	0.786	C	0.015
37	I-110 SB On/Off Ramps and Hamilton Ave.	0.502	A	0.503	A	0.001
38	Figueroa St. and I-110 NB On/Off Ramps	0.806	D	0.807	D	0.001
39	Hamilton Ave. and Torrance Bl.	0.771	C	0.793	C	0.022
40	Torrance Bl. and Figueroa St.	0.836	D	0.847	D	0.011
41	I-110 SB On/Off Ramps and Carson St.	0.773	C	0.774	C	0.001

"*" denotes a significant impact.

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Crain & Associates
August 29, 1996
DRAFT

Year 1998 Project Traffic Conditions
A.M. Peak Hour

No	Intersection	Future (1998) Conditions W/O Project CMA	W/O Project LOS	With Phase 1 Proj. CMA	With Phase 1 Proj. LOS	Impact
1	Hawthorne Bl. and 190th St.	1.038	F	1.039	F	0.001
2	Crenshaw Bl. and 182nd St.	0.930	E	0.930	E	0.000
3	Crenshaw Bl. and I-405 SB On/Off Ramps	1.018	F	1.019	F	0.001
4	Crenshaw Bl. and 190th St.	1.266	F	1.267	F	0.001
5	Crenshaw Bl. and Del Amo Bl.	0.840	D	0.841	D	0.001
6	I-405 NB On/Off Ramps and 182nd St.	0.897	D	0.897	D	0.000
7	Western Ave. and Artesia Bl.	1.009	F	1.010	F	0.001
8	Western Ave. and 182nd St.	0.465	A	0.467	A	0.002
9	Western Ave. and I-405 NB On/Off Ramps	0.631	B	0.632	B	0.001
10	I-405 SB On/Off Ramps and 190th St.	1.119	F	1.123	F	0.004
11	Western Ave. and 190th St.	0.761	C	0.761	C	0.000
12	Western Ave. and 195th St.	0.507	A	0.507	A	0.000
13	Western Ave. and Project Driveway	0.392	A	0.397	A	0.005
14	Western Ave. and Del Amo Bl.	0.759	C	0.763	C	0.004
15	Western Ave. and Torrance Bl.	0.700	B	0.702	C	0.002
16	Western Ave. and Carson St.	0.814	D	0.815	D	0.001
17	Western Ave. and Sepulveda Bl.	1.020	F	1.020	F	0.000
18	Western Ave. and Pacific Coast Highway	0.992	E	0.992	E	0.000
19	Project Driveway and 190th St.	0.557	A	0.555	A	-0.002
20	Artesia Bl. and Normandie Ave.	0.890	D	0.892	D	0.002
21	Normandie Ave. and 182nd St.	0.336	A	0.337	A	0.001
22	Normandie Ave. and I-405 NB On-Off Ramp	0.573	A	0.581	A	0.008
23	I-405 SB Off Ramp and 190th St.	0.534	A	0.558	A	0.024
24	Normandie Ave. and 190th St.	0.792	C	0.805	D	0.013
25	Normandie Ave. and Project Driveway/Fra	0.394	A	0.399	A	0.005
26	Normandie Ave. and Torrance Bl.	0.671	B	0.680	B	0.009
27	Normandie Ave. and Carson St.	0.631	B	0.633	B	0.002
28	Sepulveda Bl. and Normandie Ave.	0.723	C	0.724	C	0.001
29	Pacific Coast Hwy. and Normandie Ave.	0.515	A	0.515	A	0.000
30	Vermont Ave. and Artesia Bl.	0.929	E	0.929	E	0.000
31	Vermont Ave. and 190th St.	0.746	C	0.749	C	0.003
32	Vermont Ave. and Torrance Bl.	0.712	C	0.713	C	0.001
33	Vermont Ave. and Carson St.	0.765	C	0.765	C	0.000
34	I-110 SB Off Ramp and 190th St.	0.472	A	0.478	A	0.006
35	I-110 NB on Ramp and 190th St.	0.483	A	0.488	A	0.005
36	Figueroa St. and 190th St.	0.520	A	0.523	A	0.003
37	I-110 SB On/Off Ramps and Hamilton Ave.	0.476	A	0.476	A	0.000
38	Figueroa St. and I-110 NB On/Off Ramps	0.722	C	0.723	C	0.001
39	Hamilton Ave. and Torrance Bl.	0.787	C	0.790	C	0.003
40	Torrance Bl. and Figueroa St.	0.698	B	0.700	B	0.002
41	I-110 SB On/Off Ramps and Carson St.	0.916	E	0.916	E	0.000

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Crain & Associates
August 29, 1996
DRAFT

Year 1998 Project Traffic Conditions
Peak Hour Summary

Number of intersections with significant impacts:

	With Project
AM Peak Hour Only:	0
PM Peak Hour Only:	8
AM & PM Peak Hour:	0
Total AM Peak Hour:	0
Total PM Peak Hour:	8
Total (AM or PM):	8

J:\ICAP4\HRBRGATE\PH1REV01 RL

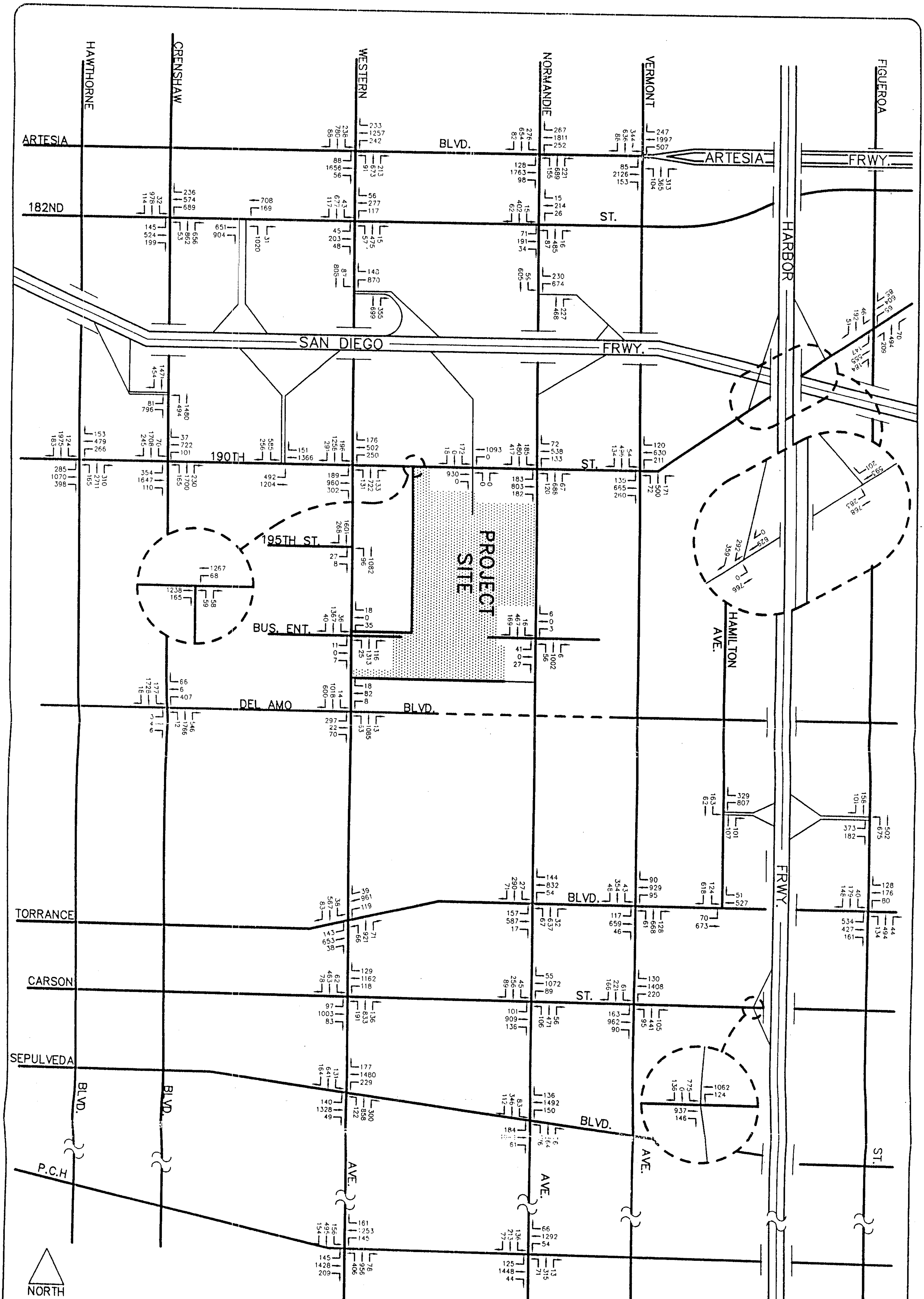

FIGURE A-1(a)

8/29/1996

FN: MCDONNEL\AM1998WO

FUTURE (1998) TRAFFIC VOLUMES
WITHOUT PROJECT
AM PEAK HOUR

CRAIN & ASSOCIATES
2007 Sawtelle Boulevard
Los Angeles, California 90025
(310) 473-6508
Transportation Planning · Traffic Engineering

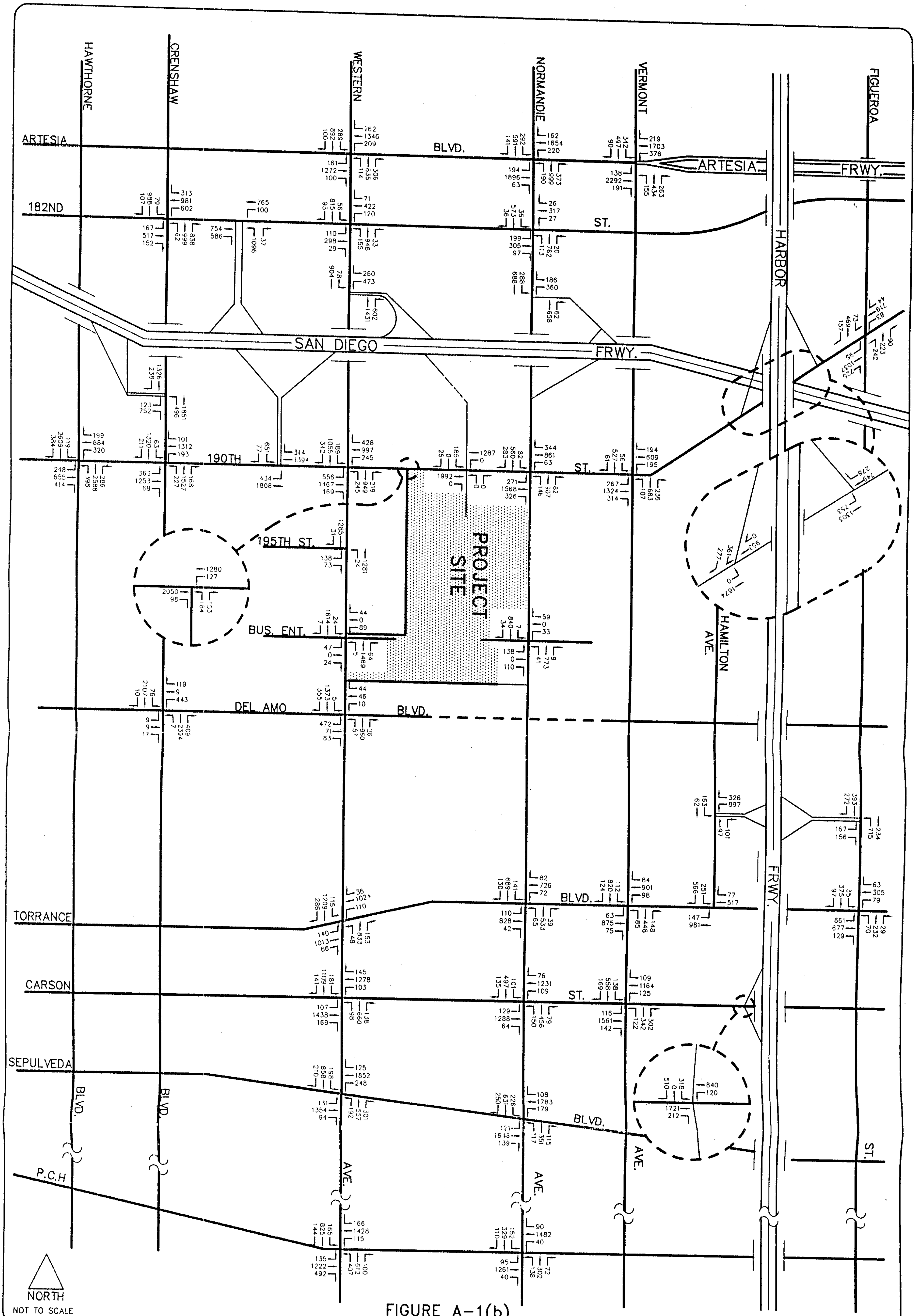

FIGURE A-1(b)

FN: MCDONNEL\PM1998WO

FUTURE (1998) TRAFFIC VOLUMES
WITHOUT PROJECT
PM PEAK HOUR

CRAIN & ASSOCIATES
2007 Sawtelle Boulevard
Los Angeles, California 90025
(310) 473-6506
Transportation Planning · Traffic Engineering

BOE-C6-0075985

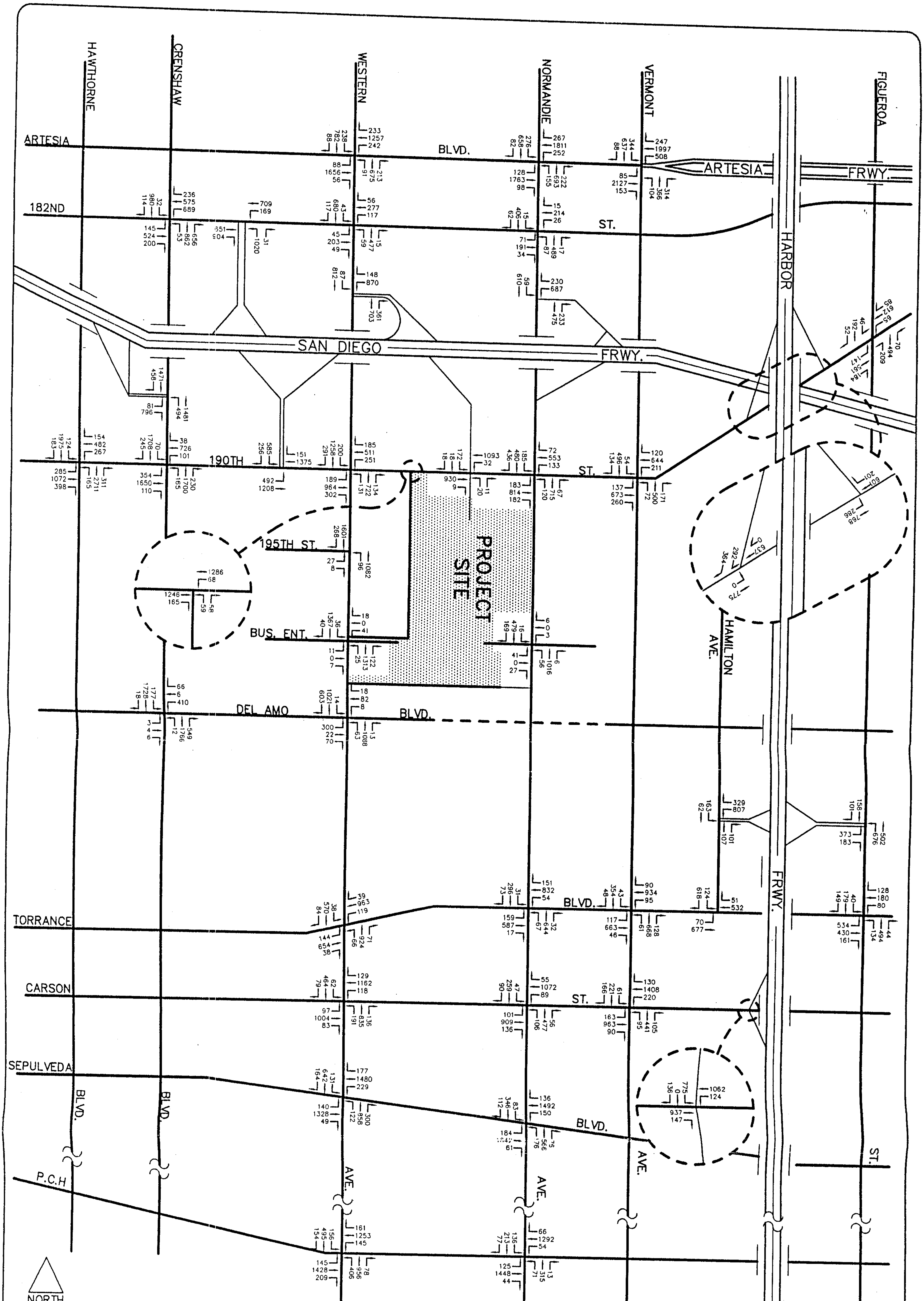

FIGURE A-2(a)

8/29/1996

FN: MCDONNEL\AM1998WP

FUTURE (1998) TRAFFIC VOLUMES
WITH PROJECT
AM PEAK HOUR

CRAIN & ASSOCIATES
2007 Sawtelle Boulevard
Los Angeles, California 90025
(310) 473-6508
Transportation Planning · Traffic Engineering

BOE-C6-0075986

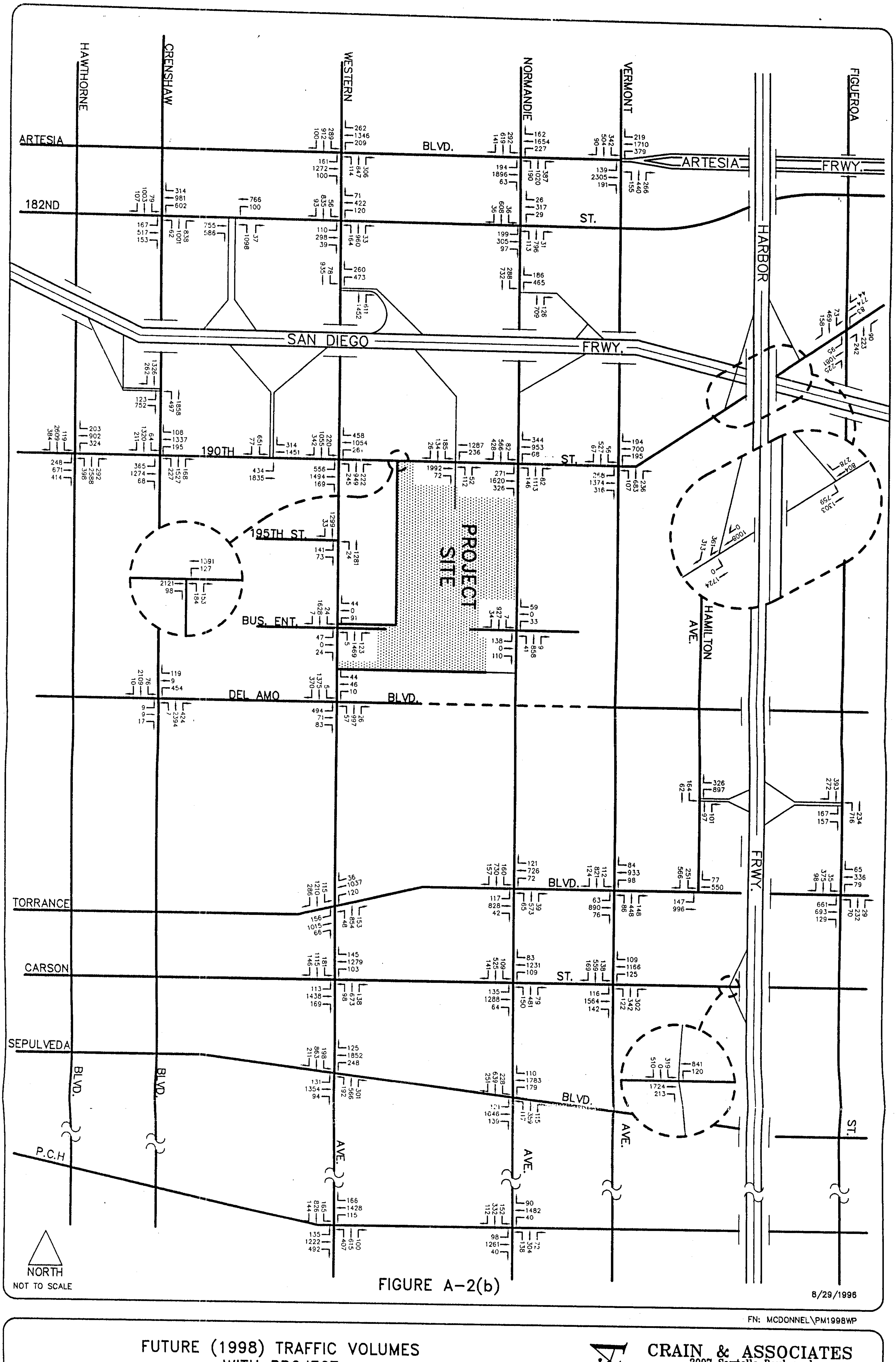

FIGURE A-2(b)

FN: MCDONNEL\PM1998WP

FUTURE (1998) TRAFFIC VOLUMES
WITH PROJECT
PM PEAK HOUR

CRAIN & ASSOCIATES
2007 Sawtelle Boulevard
Los Angeles, California 90025
(310) 473-6508
Transportation Planning · Traffic Engineering

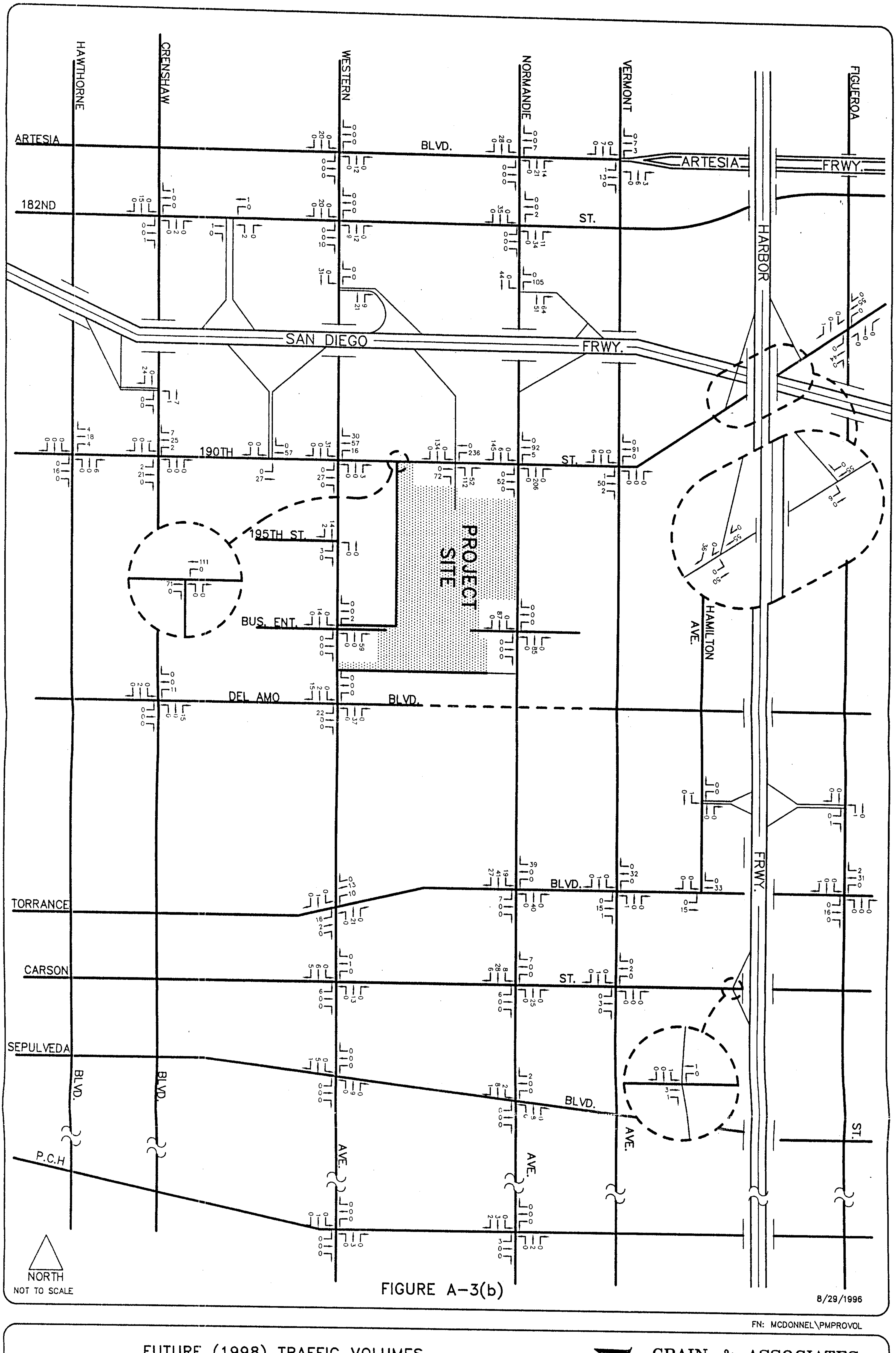

FIGURE A-3(b)

8/29/1996

FN: MCDONNEL\PMPROVOL

FUTURE (1998) TRAFFIC VOLUMES
PHASE 1 PROJECT
PM PEAK HOUR

CRAIN & ASSOCIATES
2007 Sawtelle Boulevard
Los Angeles, California 90025
(310) 473-6508
Transportation Planning · Traffic Engineering

BOE-C6-0075988

APPENDIX B

TDM ORDINANCE (NO.168,700)

SUBJECT : TRANSPORTATION DEMAND MANAGEMENT AND TRIP REDUCTION MEASURES

ORDINANCE NO. 168700

An ordinance adding Subsection J to Section 12.26 of the Los Angeles Municipal Code to provide transportation demand management features within new buildings which would facilitate the use of alternative transportation modes to decrease dependency on vehicles carrying only one person.

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Section 1. A new Subsection J is hereby added to Section 12.26 of the Los Angeles Municipal Code to read:

J. Transportation Demand Management and Trip Reduction Measures.

1. DEFINITIONS. For the purpose of this section, certain words and terms are defined as follows:

Carpool. A vehicle carrying two to five persons to and from work on a regular schedule.

Development. The construction of new non-residential floor area.

Gross Floor Area. That area in square feet confined within the outside surface of the exterior walls of a building, as calculated by adding the total square footage of each of the floors in the building, except for that square footage devoted to vehicle parking and necessary interior driveways and ramps.

Preferential Parking. Parking spaces, designated or assigned through use of a sign or painted space markings for Carpools or Vanpools, that are provided in a location more convenient to the entrance for the place of employment than parking spaces provided for single-occupant vehicles.

Transportation Demand Management (TDM). The alteration of travel behavior through programs of incentives, services, and policies, including encouraging the use of alternatives to single-occupant vehicles such as public transit, cycling, walking, carpooling/vanpooling and changes in work schedule that move trips out of the peak period or eliminate them altogether (as in the case in telecommuting or compressed work weeks).

Trip Reduction. Reduction in the number of work-related trips made by single-occupant vehicles.

Vanpool. A vehicle carrying six or more persons to and from work on a regular schedule, and on a prepaid basis.

Vehicle. Any motorized form of transportation, including but not limited to automobiles, vans, buses and motorcycles.

2. APPLICABILITY. This subdivision applies only to the construction of new non-residential gross floor area. Prior to the issuance of a building permit, the owner/applicant shall agree, by way of a covenant that runs with the land, to provide and maintain in a state of good repair the following applicable transportation demand management and trip reduction measures.

3. REQUIREMENTS:

(a) Development in excess of 25,000 square feet of gross floor area. The owner shall provide a bulletin board, display case, or kiosk (displaying transportation information) where the greatest number of employees are likely to see it. The transportation information displayed should include, but is not limited to, the following:

(1) Current routes and schedules for public transit serving the site;

(2) Telephone numbers for referrals on transportation information including numbers for the regional ridesharing agency and local transit operations;

(3) Ridesharing promotion material supplied by commuter-oriented organizations;

(4) Regional/local bicycle route and facility information;

(5) A listing of on-site services or facilities which are available for carpoolers, vanpoolers, bicyclists, and transit riders.

(b) Development in excess of 50,000 square feet of gross floor area. The owner shall comply with Paragraph (a) above and in addition shall provide:

(1) A designated parking area for employee carpools and vanpools as close as practical to the main pedestrian entrance(s) of the building(s). This area shall include at least ten percent of the parking spaces required for the site. The spaces shall be signed and striped sufficient to meet the employee demand for such spaces. The carpool/vanpool parking area shall be identified on the driveway and circulation plan upon application for a building permit;

(2) One permanent, clearly identified (signed and striped) carpool/vanpool parking space for the first 50,000 to 100,000 square feet of gross floor area and one additional permanent, clearly identified (signed and striped) carpool/vanpool parking space for any development over 100,000 square feet of gross floor area;

(3) Parking spaces clearly identified (signed and striped) shall be provided in the designated carpool/vanpool parking area at any time during the building's occupancy sufficient to meet employee demand for such spaces. Absent such demand, parking spaces within the designated carpool/vanpool parking area may be used by other vehicles;

(4) No signed and striped parking spaces for carpool/vanpool parking shall displace any handicapped parking;

(5) A statement that preferential carpool/vanpool spaces are available on-site and a description of the method for obtaining permission to use such spaces shall be included on the required transportation information board;

(6) A minimum vertical clearance of 7 feet 2 inches shall be provided for all parking spaces and accessways used by vanpool vehicles when located within a parking structure;

(7) Bicycle parking shall be provided in conformance with Section 12.21 A 16 of this Code.

(c) Development in excess of 100,000 square feet of gross floor area. The owner shall comply with Paragraphs (a) and (b) above and shall provide:

(1) A safe and convenient area in which carpool/vanpool vehicles may load and unload passengers other than in their assigned parking area;

(2) Sidewalks or other designated pathways following direct and safe routes from the external pedestrian circulation system to each building in the development;

(3) If determined necessary by the City to mitigate the project impact, bus stop improvements shall be provided. The City will consult with the local bus service providers in determining appropriate improvements. When locating bus stops and/or planning building entrances, entrances shall be designed to provide safe and efficient access to nearby transit stations/stops;

(4) Safe and convenient access from the external circulation system to bicycle parking facilities on-site.

4. EXCEPTIONS. The provisions of this subsection shall not apply to developments for which an application has been deemed complete by the City pursuant to Government Code Section 65943, or for which a Notice of Preparation for a Draft Environmental Impact Report has been circulated or for which plans sufficient for a complete plan check were accepted by the Department of Building and Safety, on or before the effective date of this ordinance.

5. MONITORING. The Department of Transportation shall be responsible for monitoring the owner/applicant's continual implementation and maintenance of the project trip reduction features required by this ordinance.

6. ENFORCEMENT. Applicants shall execute and record a Covenant and Agreement that the trip reduction features required by this ordinance will be maintained, that required material specified in Subdivision 3 (a) (1)-(5) will be continually posted, and that additional carpool/vanpool spaces within the designated preferential area will be signed and striped for the use of ridesharing employees based on demand for such spaces. The Covenant and Agreement shall be acceptable to the Department of Transportation.

7. HARDSHIP EXEMPTION. In cases of extreme hardship, duly established to its satisfaction, the City Council, acting in its legislative capacity, and by resolution, may grant an exemption from any/or all the provisions of this Ordinance. In granting such an exemption, the City Council shall make the following findings:

(a) Specific features of the development make it infeasible to satisfy all of the provisions of this subsection; and

(b) The applicant has committed to provide equivalent alternative measures to reduce vehicle trips.

Sec. 2. URGENCY CLAUSE. The City Council declares that this ordinance is required for the immediate preservation of the public peace, health and safety. The City is required to comply, in a timely manner, with the State mandated Congestion Management Program. This ordinance would prevent the potential loss to the City of millions of dollars in gas tax revenues. The loss of these funds would result in a threat to the peace, health and safety of the citizens of this City because the repair of essential streets and highways would not be feasible without the State funds. Accidents would occur and congestion due to impassible streets would result in pollution inimicable to the health and safety of the residents of the City. For these reasons this ordinance shall become effective upon publication pursuant to Section 218 of the Los Angeles City Charter.

Sec. 3. The City Clerk shall certify to the passage of this ordinance and cause the same to be published in some daily newspaper printed and published in the City of Los Angeles.

I hereby certify that the foregoing ordinance was passed by the Council of the City of Los Angeles, at its meeting of MAR 23 1993

ELIAS MARTINEZ, City Clerk,

By [signature]
Deputy.

Approved MAR 26 1993

[signature]
ACTING Mayor.

LAJ 414037 3/31

Approved as to Form and Legality

3/17/93

JAMES K. HAHN, City Attorney,

By Claudia Culling

File No. 93-0456

City Clerk Form 23

Pursuant to ... ordinance recommended by the City Planning Commission

MAR 16 1993

See attached report

[signature]
Director of Planning

BOE-C6-0075991

APPENDIX C

SHARED PARKING ANALYSIS

SUMMARY OF SEASONAL PEAK SHARED PARKING DEMANDS

MONTH	CINEMA	REST.	RETAIL	TOTAL
WEEKEND SHARED PARKING REQUIREMENTS				
January	454	86	923	1,463
February	353	81	923	1,357
March	252	97	994	1,343
April	353	97	994	1,444
May	353	103	994	1,449
June	504	108	1,065	1,677
July	504	108	1,065	1,677
August	353	92	1,065	1,510
September	403	86	1,065	1,555
October	353	86	1,065	1,504
Novenmber	252	86	1,136	1,474
December	252	97	1,420	1,769
Annual	252	97	1,420	1,769
WEEKDAY SHARED PARKING REQUIREMENTS				
January	540	192	763	1,495
February	420	180	763	1,363
March	300	216	822	1,338
April	420	216	822	1,458
May	420	228	822	1,470
June	600	240	880	1,720
July	600	240	880	1,720
August	420	204	880	1,504
September	480	192	880	1,552
October	420	192	880	1,492
Novenmber	300	192	939	1,431
December	210	151	1,349	1,710
Annual	600	240	880	1,720

CINEMA AND RESTAURANT PARKING RATES ADJUSTED FOR CAPTIVE MARKET

	CINEMA	REST.	RETAIL
CITY CODE STAND ALONE PARKING RATE	0.20	10.00	4.00
INTERNAL CAPTURE RATE	10%	20%	0%
ADJUSTED RATE	0.18	8.00	4.00

HARBOR GATEWAY CENTER DESCRIPTION

SIZE	4,000	30.000	355.000
UNITS	SEATS	SQ.FT.	SQ.FT.

	CINEMA	REST.	RETAIL	TOTAL
STAND ALONE SPACES	800	300	1420	2,520
SPACES W/ INTERNAL CAPTURE	720	240	1420	2,380

BASE WEEKEND SHARED PARKING REQUIREMENTS
WITHOUT SEASONAL ADJUSTMENTS

TIME OF DAY	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	43	47
8	0	7	142	149
9	0	14	426	440
10	0	19	639	658
11	0	24	1,037	1,061
12 Noon	216	72	1,207	1,495
1 PM	504	108	1,349	1,961
2	504	108	1,420	2,032
3	504	108	1,420	2,032
4	504	108	1,278	1,890
5	504	144	1,065	1,713
6	576	216	923	1,715
7	648	228	852	1,728
8	720	240	781	1,741
9	720	240	568	1,528
10	720	228	540	1,488
11	576	204	185	965
12 Midnight	504	168	0	672
WITH SHARED USE	504	108	1,420	2,032

CINEMA AND RESTAURANT PARKING RATES ADJUSTED FOR CAPTIVE MARKET

	CINEMA	REST.	RETAIL
CITY CODE STAND ALONE PARKING RATE	0.20	10.00	4.00
INTERNAL CAPTURE RATE	10%	20%	0%
ADJUSTED RATE	0.18	8.00	4.00

HARBOR GATEWAY CENTER DESCRIPTION

SIZE	4,000	30.000	355.000
UNITS	SEATS	SQ.FT.	SQ.FT.

	CINEMA	REST.	RETAIL	TOTAL
STAND ALONE SPACES	800	300	1420	2,520
SPACES W/ INTERNAL CAPTURE	720	240	1420	2,380

BASE WEEKDAY SHARED PARKING REQUIREMENTS
WITHOUT SEASONAL ADJUSTMENTS

TIME OF DAY	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	108	113
8	0	12	243	255
9	0	24	567	591
10	0	48	917	965
11	0	72	1,174	1,246
12 Noon	180	120	1,309	1,609
1 PM	420	168	1,349	1,937
2	420	144	1,309	1,873
3	420	144	1,282	1,846
4	420	120	1,174	1,714
5	420	168	1,066	1,654
6	480	216	1,106	1,802
7	540	240	1,201	1,981
8	600	240	1,174	2,014
9	600	240	823	1,663
10	600	216	432	1,248
11	480	168	175	823
12 Midnight	420	120	0	540
WITH SHARED USE	600	240	1,174	2,014

January

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	90%	80%	65%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	28	32
8	0	6	92	98
9	0	12	277	288
10	0	15	415	431
11	0	19	674	693
12 Noon	194	58	785	1,037
1 PM	454	86	877	1,417
2	454	86	923	1,463
3	454	86	923	1,463
4	454	86	831	1,371
5	454	115	692	1,261
6	518	173	600	1,291
7	583	182	554	1,319
8	648	192	508	1,348
9	648	192	369	1,209
10	648	182	351	1,181
11	518	163	120	802
12 Midnight	454	134	0	588
WITH SHARED USE	454	86	923	1,463

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	70	74
8	0	10	158	167
9	0	19	368	387
10	0	38	596	635
11	0	58	763	820
12 Noon	162	96	851	1,109
1 PM	378	134	877	1,389
2	378	115	851	1,344
3	378	115	833	1,326
4	378	96	763	1,237
5	378	134	693	1,205
6	432	173	719	1,324
7	486	192	780	1,458
8	540	192	763	1,495
9	540	192	535	1,267
10	540	173	281	993
11	432	134	114	680
12 Midnight	378	96	0	474
WITH SHARED USE	540	192	763	1,495

February

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	70%	75%	65%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	28	31
8	0	5	92	98
9	0	11	277	288
10	0	14	415	430
11	0	18	674	692
12 Noon	151	54	785	990
1 PM	353	81	877	1,311
2	353	81	923	1,357
3	353	81	923	1,357
4	353	81	831	1,265
5	353	108	692	1,153
6	403	162	600	1,165
7	454	171	554	1,178
8	504	180	508	1,192
9	504	180	369	1,053
10	504	171	351	1,026
11	403	153	120	676
12 Midnight	353	126	0	479
WITH SHARED USE	353	81	923	1,357

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	70	74
8	0	9	158	167
9	0	18	368	386
10	0	36	596	632
11	0	54	763	817
12 Noon	126	90	851	1,067
1 PM	294	126	877	1,297
2	294	108	851	1,253
3	294	108	833	1,235
4	294	90	763	1,147
5	294	126	693	1,113
6	336	162	719	1,217
7	378	180	780	1,338
8	420	180	763	1,363
9	420	180	535	1,135
10	420	162	281	863
11	336	126	114	576
12 Midnight	294	90	0	384
WITH SHARED USE	420	180	763	1,363

March

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	50%	90%	70%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	30	34
8	0	6	99	106
9	0	13	298	311
10	0	17	447	465
11	0	22	726	747
12 Noon	108	65	845	1,018
1 PM	252	97	944	1,294
2	252	97	994	1,343
3	252	97	994	1,343
4	252	97	895	1,244
5	252	130	746	1,127
6	288	194	646	1,129
7	324	205	596	1,126
8	360	216	547	1,123
9	360	216	398	974
10	360	205	378	943
11	288	184	129	601
12 Midnight	252	151	0	403
WITH SHARED USE	252	97	994	1,343

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	76	80
8	0	11	170	181
9	0	22	397	418
10	0	43	642	685
11	0	65	822	886
12 Noon	90	108	916	1,114
1 PM	210	151	944	1,306
2	210	130	916	1,256
3	210	130	897	1,237
4	210	108	822	1,140
5	210	151	746	1,107
6	240	194	774	1,209
7	270	216	840	1,326
8	300	216	822	1,338
9	300	216	576	1,092
10	300	194	302	797
11	240	151	123	514
12 Midnight	210	108	0	318
WITH SHARED USE	300	216	822	1,338

April

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	70%	90%	70%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	30	34
8	0	6	99	106
9	0	13	298	311
10	0	17	447	465
11	0	22	726	747
12 Noon	151	65	845	1,061
1 PM	353	97	944	1,394
2	353	97	994	1,444
3	353	97	994	1,444
4	353	97	895	1,345
5	353	130	746	1,228
6	403	194	646	1,244
7	454	205	596	1,255
8	504	216	547	1,267
9	504	216	398	1,118
10	504	205	378	1,087
11	403	184	129	716
12 Midnight	353	151	0	504
WITH SHARED USE	353	97	994	1,444

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	76	80
8	0	11	170	181
9	0	22	397	418
10	0	43	642	685
11	0	65	822	886
12 Noon	126	108	916	1,150
1 PM	294	151	944	1,390
2	294	130	916	1,340
3	294	130	897	1,321
4	294	108	822	1,224
5	294	151	746	1,191
6	336	194	774	1,305
7	378	216	840	1,434
8	420	216	822	1,458
9	420	216	576	1,212
10	420	194	302	917
11	336	151	123	610
12 Midnight	294	108	0	402
WITH SHARED USE	420	216	822	1,458

May

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	70%	95%	70%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	30	34
8	0	7	99	106
9	0	14	298	312
10	0	18	447	466
11	0	23	726	748
12 Noon	151	68	845	1,065
1 PM	353	103	944	1,400
2	353	103	994	1,449
3	353	103	994	1,449
4	353	103	895	1,350
5	353	137	746	1,235
6	403	205	646	1,255
7	454	217	596	1,267
8	504	228	547	1,279
9	504	228	398	1,130
10	504	217	378	1,098
11	403	194	129	726
12 Midnight	353	160	0	512
WITH SHARED USE	353	103	994	1,449

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	76	80
8	0	11	170	181
9	0	23	397	419
10	0	46	642	688
11	0	68	822	890
12 Noon	126	114	916	1,156
1 PM	294	160	944	1,398
2	294	137	916	1,347
3	294	137	897	1,328
4	294	114	822	1,230
5	294	160	746	1,200
6	336	205	774	1,316
7	378	228	840	1,446
8	420	228	822	1,470
9	420	228	576	1,224
10	420	205	302	927
11	336	160	123	618
12 Midnight	294	114	0	408
WITH SHARED USE	420	228	822	1,470

June

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	100%	100%	75%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	32	37
8	0	7	107	114
9	0	14	320	334
10	0	19	479	498
11	0	24	777	801
12 Noon	216	72	905	1,193
1 PM	504	108	1,012	1,624
2	504	108	1,065	1,677
3	504	108	1,065	1,677
4	504	108	959	1,571
5	504	144	799	1,447
6	576	216	692	1,484
7	648	228	639	1,515
8	720	240	586	1,546
9	720	240	426	1,386
10	720	228	405	1,353
11	576	204	138	918
12 Midnight	504	168	0	672
WITH SHARED USE	504	108	1,065	1,677

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	81	86
8	0	12	182	194
9	0	24	425	449
10	0	48	688	736
11	0	72	880	952
12 Noon	180	120	981	1,281
1 PM	420	168	1,012	1,600
2	420	144	981	1,545
3	420	144	961	1,525
4	420	120	880	1,420
5	420	168	799	1,387
6	480	216	830	1,526
7	540	240	900	1,680
8	600	240	880	1,720
9	600	240	617	1,457
10	600	216	324	1,140
11	480	168	132	780
12 Midnight	420	120	0	540
WITH SHARED USE	600	240	880	1,720

July

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	100%	100%	75%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	32	37
8	0	7	107	114
9	0	14	320	334
10	0	19	479	498
11	0	24	777	801
12 Noon	216	72	905	1,193
1 PM	504	108	1,012	1,624
2	504	108	1,065	1,677
3	504	108	1,065	1,677
4	504	108	959	1,571
5	504	144	799	1,447
6	576	216	692	1,484
7	648	228	639	1,515
8	720	240	586	1,546
9	720	240	426	1,386
10	720	228	405	1,353
11	576	204	138	918
12 Midnight	504	168	0	672
WITH SHARED USE	504	108	1,065	1,677

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	5	81	86
8	0	12	182	194
9	0	24	425	449
10	0	48	688	736
11	0	72	880	952
12 Noon	180	120	981	1,281
1 PM	420	168	1,012	1,600
2	420	144	981	1,545
3	420	144	961	1,525
4	420	120	880	1,420
5	420	168	799	1,387
6	480	216	830	1,526
7	540	240	900	1,680
8	600	240	880	1,720
9	600	240	617	1,457
10	600	216	324	1,140
11	480	168	132	780
12 Midnight	420	120	0	540
WITH SHARED USE	600	240	880	1,720

August

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	70%	85%	75%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	32	36
8	0	6	107	113
9	0	12	320	332
10	0	16	479	496
11	0	20	777	798
12 Noon	151	61	905	1,118
1 PM	353	92	1,012	1,456
2	353	92	1,065	1,510
3	353	92	1,065	1,510
4	353	92	959	1,403
5	353	122	799	1,274
6	403	184	692	1,279
7	454	194	639	1,286
8	504	204	586	1,294
9	504	204	426	1,134
10	504	194	405	1,103
11	403	173	138	715
12 Midnight	353	143	0	496
WITH SHARED USE	353	92	1,065	1,510

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	81	85
8	0	10	182	192
9	0	20	425	445
10	0	41	688	729
11	0	61	880	941
12 Noon	126	102	981	1,209
1 PM	294	143	1,012	1,449
2	294	122	981	1,398
3	294	122	961	1,378
4	294	102	880	1,276
5	294	143	799	1,236
6	336	184	830	1,349
7	378	204	900	1,482
8	420	204	880	1,504
9	420	204	617	1,241
10	420	184	324	927
11	336	143	132	610
12 Midnight	294	102	0	396
WITH SHARED USE	420	204	880	1,504

September

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	80%	80%	75%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	32	36
8	0	6	107	112
9	0	12	320	331
10	0	15	479	495
11	0	19	777	797
12 Noon	173	58	905	1,136
1 PM	403	86	1,012	1,501
2	403	86	1,065	1,555
3	403	86	1,065	1,555
4	403	86	959	1,448
5	403	115	799	1,317
6	461	173	692	1,326
7	518	182	639	1,340
8	576	192	586	1,354
9	576	192	426	1,194
10	576	182	405	1,163
11	461	163	138	762
12 Midnight	403	134	0	538
WITH SHARED USE	403	86	1,065	1,555

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	81	85
8	0	10	182	192
9	0	19	425	444
10	0	38	688	726
11	0	58	880	938
12 Noon	144	96	981	1,221
1 PM	336	134	1,012	1,482
2	336	115	981	1,433
3	336	115	961	1,412
4	336	96	880	1,312
5	336	134	799	1,270
6	384	173	830	1,386
7	432	192	900	1,524
8	480	192	880	1,552
9	480	192	617	1,289
10	480	173	324	977
11	384	134	132	650
12 Midnight	336	96	0	432
WITH SHARED USE	480	192	880	1,552

October

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	70%	80%	75%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	32	36
8	0	6	107	112
9	0	12	320	331
10	0	15	479	495
11	0	19	777	797
12 Noon	151	58	905	1,114
1 PM	353	86	1,012	1,451
2	353	86	1,065	1,504
3	353	86	1,065	1,504
4	353	86	959	1,398
5	353	115	799	1,267
6	403	173	692	1,268
7	454	182	639	1,275
8	504	192	586	1,282
9	504	192	426	1,122
10	504	182	405	1,091
11	403	163	138	705
12 Midnight	353	134	0	487
WITH SHARED USE	353	86	1,065	1,504

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	81	85
8	0	10	182	192
9	0	19	425	444
10	0	38	688	726
11	0	58	880	938
12 Noon	126	96	981	1,203
1 PM	294	134	1,012	1,440
2	294	115	981	1,391
3	294	115	961	1,370
4	294	96	880	1,270
5	294	134	799	1,228
6	336	173	830	1,338
7	378	192	900	1,470
8	420	192	880	1,492
9	420	192	617	1,229
10	420	173	324	917
11	336	134	132	602
12 Midnight	294	96	0	390
WITH SHARED USE	420	192	880	1,492

November

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	50%	80%	80%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	34	38
8	0	6	114	119
9	0	12	341	352
10	0	15	511	527
11	0	19	829	848
12 Noon	108	58	966	1,131
1 PM	252	86	1,079	1,418
2	252	86	1,136	1,474
3	252	86	1,136	1,474
4	252	86	1,022	1,361
5	252	115	852	1,219
6	288	173	738	1,199
7	324	182	682	1,188
8	360	192	625	1,177
9	360	192	454	1,006
10	360	182	432	974
11	288	163	148	599
12 Midnight	252	134	0	386
WITH SHARED USE	252	86	1,136	1,474

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	86	90
8	0	10	194	204
9	0	19	453	472
10	0	38	734	772
11	0	58	939	997
12 Noon	90	96	1,047	1,233
1 PM	210	134	1,079	1,424
2	210	115	1,047	1,372
3	210	115	1,025	1,350
4	210	96	939	1,245
5	210	134	853	1,197
6	240	173	885	1,298
7	270	192	960	1,422
8	300	192	939	1,431
9	300	192	658	1,150
10	300	173	345	818
11	240	134	140	515
12 Midnight	210	96	0	306
WITH SHARED USE	300	192	939	1,431

December

	CINEMA	REST.	RETAIL	TOTAL
Percent of Peak Month	50%	90%	100%	

WEEKEND SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	43	47
8	0	6	142	148
9	0	13	426	439
10	0	17	639	656
11	0	22	1,037	1,058
12 Noon	108	65	1,207	1,380
1 PM	252	97	1,349	1,698
2	252	97	1,420	1,769
3	252	97	1,420	1,769
4	252	97	1,278	1,627
5	252	130	1,065	1,447
6	288	194	923	1,405
7	324	205	852	1,381
8	360	216	781	1,357
9	360	216	568	1,144
10	360	205	540	1,105
11	288	184	185	656
12 Midnight	252	151	0	403
WITH SHARED USE	252	97	1,420	1,769

WEEKDAY SHARED PARKING REQUIREMENTS

	CINEMA	REST.	RETAIL	TOTAL
6 AM	0	0	0	0
7	0	4	108	112
8	0	11	243	254
9	0	22	567	588
10	0	43	917	961
11	0	65	1,174	1,238
12 Noon	90	108	1,309	1,507
1 PM	210	151	1,349	1,710
2	210	130	1,309	1,648
3	210	130	1,282	1,621
4	210	108	1,174	1,492
5	210	151	1,066	1,427
6	240	194	1,106	1,541
7	270	216	1,201	1,687
8	300	216	1,174	1,690
9	300	216	823	1,339
10	300	194	432	926
11	240	151	175	567
12 Midnight	210	108	0	318
WITH SHARED USE	210	151	1,349	1,710

WEEKEND HOURLY ACCUMULATION BY PERCENTAGE OF PEAK HOUR

TIME OF DAY	CINEMA	RESTAURANT	RETAIL
6 AM	-	-	-
7	-	2%	3%
8	-	3%	10%
9	-	6%	30%
10	-	8%	45%
11	-	10%	73%
12 Noon	30%	30%	85%
1 PM	70%	45%	95%
2	70%	45%	100%
3	70%	45%	100%
4	70%	45%	90%
5	70%	60%	75%
6	80%	90%	65%
7	90%	95%	60%
8	100%	100%	55%
9	100%	100%	40%
10	100%	95%	38%
11	80%	85%	13%
12 Midnight	70%	70%	-
Weekend Peak Demand/Rate	100%	100%	100%

WEEKDAY HOURLY ACCUMULATION BY PERCENTAGE OF PEAK HOUR

TIME OF DAY	CINEMA	RESTAURANT	RETAIL
6 AM	-	-	-
7	-	2%	8%
8	-	5%	18%
9	-	10%	42%
10	-	20%	68%
11	-	30%	87%
12 Noon	30%	50%	97%
1 PM	70%	70%	100%
2	70%	60%	97%
3	70%	60%	95%
4	70%	50%	87%
5	70%	70%	79%
6	80%	90%	82%
7	90%	100%	89%
8	100%	100%	87%
9	100%	100%	61%
10	100%	90%	32%
11	80%	70%	13%
12 Midnight	70%	50%	-
Weekday Peak Demand/Rate	83%	100%	95%

APPENDIX D

CRITICAL MOVEMENT ANALYSIS CALCULATIONS

(under separate cover)

Appendix F-1
Alternative Trip Generation Calculations

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 1 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Warehouse	2,419,000	8,560	608	237	845	387	718	1,105
Site Generation	2,419,000	8,560	608	237	845	387	718	1,105
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	0	0	0	0	0	0	0	0

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 2 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Retail*	425,000	15,710	214	126	340	740	739	1,479
Theater - 5,000 Seat	80,000	2,420	95	55	150	192	108	300
Hotel - 350 Rooms	240,000	3,020	146	98	244	137	117	254
Medical Office	10,000	240	32	10	42	11	27	38
Sports Club	45,000	1,810	6	8	14	116	78	194
	-------	------	---	---	-----	-----	-----	-----
Subtotal	800,000	23,200	493	297	790	1,196	1,069	2,265
Less Internal/Pass-by Trips								
Retail (0%/20%)		(3,140)	(43)	(25)	(68)	(148)	(148)	(296)
Theater (10%/10%)		(480)	(19)	(11)	(30)	(38)	(22)	(60)
Hotel (10%/0%)		(300)	(15)	(9)	(24)	(14)	(11)	(25)
Medical Office (10%/10%)		(50)	(6)	(2)	(8)	(2)	(6)	(8)
Sports Club (10%/20%)		(540)	(2)	(2)	(4)	(35)	(23)	(58)
		-----	---	---	-----	-----	-----	-----
Subtotal		(4,510)	(85)	(49)	(134)	(237)	(210)	(447)
Shopping Center Site Subtotal	800,000	18,690	408	248	656	959	859	1,818
Office Park	798,000	8,220	1,129	140	1,269	153	868	1,021
Reseach/Development Center	291,000	2,370	285	58	343	48	275	323
Industrial Park	2,258,000	11,940	1,212	165	1,377	135	768	903
	-------	------	---	---	-----	-----	-----	-----
Site Generation	4,147,000	41,220	3,034	611	3,645	1,295	2,770	4,065
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	1,728,000	32,660	2,426	374	2,800	908	2,052	2,960
	=========	======	=====	=====	=====	===	=====	=====
Combined Projects Generation		48,820	1,847	343	2,190	1,892	2,536	4,428
Difference		(16,160)	579	31	610	(984)	(485)	(1,469)
		======	===	=	===	===	===	=====
								(859)

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* Rate for 560,000 Sq. Ft. Shopping Center used. Includes up to 56,000 Sq. Ft. restuarants.

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 3 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Hotel - 200 Rooms	135,000	1,700	76	50	126	80	68	148
Retail*	37,000	2,390	48	28	76	121	120	241
Sports Club	20,000	810	3	3	6	52	34	86
Subtotal	192,000	4,900	127	81	208	253	222	475
Less Internal/Pass-by Trips								
Hotel (10%/20%)		(510)	(23)	(15)	(38)	(24)	(20)	(44)
Retail (0%/20%)		(480)	(10)	(5)	(15)	(24)	(24)	(48)
Sports Club (10%/0%)		(80)	0	(1)	(1)	(5)	(4)	(9)
Subtotal		(1,070)	(33)	(21)	(54)	(53)	(48)	(101)
Shopping Center Site Subtotal	192,000	3,830	94	60	154	200	174	374
Office Park	846,000	8,630	1,184	146	1,330	161	913	1,074
Industrial Park	3,355,800	17,370	1,684	230	1,914	159	898	1,057
Site Generation	4,393,800	29,830	2,962	436	3,398	520	1,985	2,505
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	1,974,800	21,270	2,354	199	2,553	133	1,267	1,400

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* Rate for 57,000 Sq. Ft. Shopping Center used.

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 4 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Retail*	288,750	12,080	180	105	285	578	577	1,155
Theater - 3,000 Seat	48,750	1,450	57	33	90	115	65	180
Subtotal	337,500	13,530	237	138	375	693	642	1,335
Less Internal/Pass-by Trips								
Retail (0%/20%)		(2,420)	(36)	(21)	(57)	(116)	(115)	(231)
Theater (10%/10%)		(290)	(11)	(7)	(18)	(23)	(13)	(36)
Subtotal		(2,710)	(47)	(28)	(75)	(139)	(128)	(267)
Shopping Center Site Subtotal	337,500	10,820	190	110	300	554	514	1,068
Office Park	380,000	4,430	615	76	691	83	472	555
Industrial Park	1,508,275	8,230	876	119	995	114	643	757
Site Generation	2,225,775	23,480	1,681	305	1,986	751	1,629	2,380
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	(193,225)	14,920	1,073	68	1,141	364	911	1,275

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* Rate for 337,500 Sq. Ft. Shopping Center used.

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 5 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Retail*	385,000	15,010	212	125	337	712	711	1,423
Theater - 4,000 Seat	65,000	1,930	76	44	120	154	86	240
Subtotal	450,000	16,940	288	169	457	866	797	1,663
Less Internal/Pass-by Trips								
Retail (0%/20%)		(3,000)	(42)	(25)	(67)	(142)	(143)	(285)
Theater (10%/10%)		(390)	(15)	(9)	(24)	(31)	(17)	(48)
Subtotal		(3,390)	(57)	(34)	(91)	(173)	(160)	(333)
Shopping Center Site Subtotal	450,000	13,550	231	135	366	693	637	1,330
Golf Course 18 Hole	--	650	41	8	49	31	29	60
Site Generation	450,000	14,200	272	143	415	724	666	1,390
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	(1,969,000)	5,640	(336)	(94)	(430)	337	(52)	285

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* Rate for 450,000 Sq. Ft. Shopping Center used.

Crain & Associates
January 15,1997
Draft

Harbor Gateway Project
Alternative 6 Trip Generation Estimate

Land-use Category	Size (Sq. Ft.)	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Office Park	746,000	7,770	1,068	132	1,200	145	823	968
Industrial Park	2,960,900	15,420	1,521	207	1,728	152	861	1,013
Site Generation	3,706,900	23,190	2,589	339	2,928	297	1,684	1,981
Less Existing Site Generation								
Warehouse	(2,419,000)	(8,560)	(608)	(237)	(845)	(387)	(718)	(1,105)
Net Site Generation Increase	1,287,900	14,630	1,981	102	2,083	(90)	966	876

Appendix G
Utility Calculations

Harbor Gateway Center - Cumulative Utility Impact Calculations

	Office	Retail	Industrial	SF Res.	MF Res.	Church	Gym	Hospital	Theater	Auto
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	286	171.6	0.055	0.66	0.33	0.1375	0.11
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	260	156	0.05	0.6	0.3	0.125	0.1
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	10	4	0.005	0.005	0.006	0.005	0.005
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	5626.5	5626.5	10.5	10.5	21.7	10.5	10.5
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	6665	4011.5	2	2.9	2.9	2.9	2

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/mo)
Office	303,624	66,797	60,725	1,822	3,931,931	607,248
Retail	3,704,864	1,324,489	1,204,081	18,524	50,200,907	10,744,106
Industrial	2,997,196	659,383	599,439	187,325	31,470,558	5,994,392
SF Residential	46	13,156	11,960	460	258,819	92
MF Residential	758	130,073	118,248	3,032	4,264,887	1,516
Church	36,094	1,985	1,805	180	378,987	72,188
Gymnasium	(15,944)	(10,523)	(9,566)	(80)	(167,412)	(31,888)
Hospital	219,530	72,445	65,859	1,317	4,763,801	439,060
Theater	78,750	10,828	9,844	394	826,875	157,500
Auto Service	14,200	1,562	1,420	71	149,100	28,400
Total	7,339,118	2,270,195	2,063,814	213,045	96,078,453	18,012,614
Proposed Project		717,156	651,960	120,216	20,970,000	5,232,100
Combined Total		2,987,351	2,715,774	333,261	117,048,453	23,244,714

Water consumption rates based upon wastewater generation rates x 1.1.

Wastewater generation rates from the County Sanitation Districts of Los Angeles County.

Solid waste generation rates from the City of Los Angeles Bureau of Sanitation, 1981.
Electricity and natural gas consumption rates from SCAQMD, CEQA Air Quality Handbook.

Theater assumed to be 12.5 sq. ft. per screen; 200 seats per screen.
167,000 sq. ft. of warehouse space included in industrial category.

Master Planned Block Development Alternative - Utility Calculations

	Office	Retail	Industrial	Hotel	Golf	Church	Gym	Hospital	Theater	Auto
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	165	171.6	0.055	0.66	0.33	0.1375	0.11
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	150	156	0.05	0.6	0.3	0.125	0.1
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	2	0	0.005	0.005	0.006	0.005	0.005
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	9.95	10.5	10.5	10.5	21.7	10.5	10.5
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	4.8	2.9	2	2.9	2.9	2.9	2

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/yr)
Office	798,000	175,560	159,600	4,788	10,334,100	19,152,000
Retail/Rest/Med Ofc	480,000	171,600	156,000	2,400	6,504,000	16,704,000
Industrial	2,549,000	560,780	509,800	159,313	26,764,500	61,176,000
Hotel	240,000	58,667	53,333	711	2,388,000	5,760,000
Theater	80,000	11,000	10,000	400	840,000	2,784,000
Total	4,147,000	977,607	888,733	167,612	46,830,600	105,576,000
Existing Consumption		16,438	15,068	12,095	18,740,000	13,300,000
Total Increase		961,169	873,665	155,517	28,090,600	92,276,000
Combined Projects		854,324	770,448	124,266	34,200,000	91,000,000
Pct. Difference		12.5%	13.4%	25.1%	-17.9%	1.4%

Water consumption rates based upon wastewater generation rates x 1.1.
Wastewater generation rates from the County Sanitation Districts of Los Angeles County.
Solid waste generation rates from the City of Los Angeles Bureau of Sanitation, 1981.

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Alternative Land Use - Utility Calculations

	Office	Retail	Industrial	Hotel	Golf
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	165	171.6
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	150	156
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	2	0
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	9.95	10.5
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	4.8	2.9

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/yr)
Office	717,833	157,923	143,567	4,307	9,295,937	17,227,992
Retail	57,000	20,378	18,525	285	772,350	1,983,600
Industrial	3,483,967	766,473	696,793	217,748	36,581,654	83,615,208
Hotel	135,000	33,000	30,000	400	1,343,250	3,240,000
Golf Course	0	0	0	0	0	0
Total	4,393,800	977,774	888,885	222,740	47,993,191	106,066,800
Existing Consumption		16,438	15,068	12,095	18,740,000	13,300,000
Net Increase		961,336	873,817	210,645	29,253,191	92,766,800
Proposed Project		720,469	654,972	120,216	20,970,000	62,800,000
Pct. Difference		33.4%	33.4%	75.2%	39.5%	47.7%

Reduced Intensity - Utility Calculations

	Office	Retail	Industrial	Hotel	Golf
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	165	171.6
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	150	156
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	2	0
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	9.95	10.5
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	4.8	2.9

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/yr)
Office	322,592	70,970	64,518	1,936	4,177,566	7,742,208
Retail	337,500	120,656	109,688	1,688	4,573,125	11,745,000
Industrial	1,565,683	344,450	313,137	97,855	16,439,672	37,576,392
Hotel	0	0	0	0	0	0
Golf Course	0	0	0	0	0	0
Total	2,225,775	536,077	487,343	101,478	25,190,363	57,063,600
Existing Consumption		16,438	15,068	12,095	18,740,000	13,300,000
Net Increase		519,639	472,275	89,383	6,450,363	43,763,600
Proposed Project		720,469	654,972	120,216	20,970,000	62,800,000
Pct. Difference		-27.9%	-27.9%	-25.6%	-69.2%	-30.3%

BOE-C6-0076022

Golf Course - Utility Calculations

	Office	Retail	Industrial	Hotel	Golf
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	165	0.115
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	150	0
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	2	0
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	9.95	0
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	4.8	0

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/yr)
Office	0	0	0	0	0	0
Retail	450,000	160,875	146,250	2,250	6,097,500	15,660,000
Industrial	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
Golf Course	5,671,512	652,224	0	0	0	0
Total		813,099	146,250	2,250	6,097,500	15,660,000
Existing Consumption		16,438	15,068	12,095	18,740,000	13,300,000
Net Increase		796,661	131,182	(9,845)	(12,642,500)	2,360,000
Proposed Project		720,469	654,972	120,216	20,970,000	62,800,000
Pct. Difference		10.6%	-80.0%	-108.2%	-160.3%	-96.2%

BOE-C6-0076023

Large Parcelization - Utility Calculations

	Office	Retail	Industrial	Hotel	Golf
Water Consumption Rate (gallons/unit/day)	0.22	0.3575	0.22	165	0.115
Wastewater Generation Rate (gallons/unit/day	0.2	0.325	0.2	150	0
Solid Waste Generation Rate (lbs/unit/day)	0.006	0.005	0.0625	2	0
Electricity Consumption Rate (kWh/unit/yr)	12.95	13.55	10.5	9.95	0
Natural Gas Consumption Rate (cf/unit/mo)	2	2.9	2	4.8	0

Use	Units	Water (gpd)	Wastewater (gpd)	Solid Waste (ppd)	Electricity (kWh/yr)	Natural Gas (cf/yr)
Office	630,000	138,600	126,000	3,780	8,158,500	15,120,000
Retail	0	0	0	0	0	0
Industrial	3,070,000	675,400	614,000	191,875	32,235,000	73,680,000
Hotel	0	0	0	0	0	0
Golf Course	0	0	0	0	0	0
Total		814,000	740,000	195,655	40,393,500	88,800,000
Existing Consumption		16,438	15,068	12,095	18,740,000	13,300,000
Net Increase		797,562	724,932	183,560	21,653,500	75,500,000
Proposed Project		720,469	654,972	120,216	20,970,000	62,800,000
Pct. Difference		10.7%	10.7%	52.7%	3.3%	20.2%

BOE-C6-0076024

Appendix H
Environmental Assessments
(Hazardous Materials)

SUMMARY PHASE I ENVIRONMENTAL ASSESSMENT
PARCEL A

MCDONNELL DOUGLAS REALTY COMPANY

JUNE 1996

K/J 954019.00

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(Continued)

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1.0 EXECUTIVE SUMMARY

McDonnell Douglas Realty Company (MDRC) retained Kennedy/Jenks Consultants to perform a Phase I Environmental Site Assessment (PESA) on a parcel (Subject Property) of the Douglas Aircraft Company (DAC) C-6 Facility in Torrance, California. The parcel, Parcel A, is approximately the northern one-quarter of the facility and is bounded by a former manufacturing facility to the west, West 190th Street to the north, South Normandie Avenue on the east, and the remainder of the C-6 facility to the south. DAC has discontinued manufacturing operations at the C-6 facility and has removed most of the process machinery. MDRC plans to redevelop Parcel A. Facility structures included in the Subject Property were Buildings 29, 33, 34, 36, 37, 57, 58, 61, and 67, the northernmost section of Building 1, and the northern end of the employee parking lot. The area surrounding the C-6 facility currently consists mainly of light industrial and manufacturing facilities.

The C-6 facility is topographically flat, with an elevation of approximately 50 feet above mean sea level. The facility is located within the Torrance Plain and underlain by the Lakewood Formation which consists mainly of gravel, sand, clay, and silt. Water bearing zones beneath the parcel include the Lynwood Aquifer and the Gage Aquifer. The groundwater gradient is generally to the southeast. Recent groundwater elevation measurements indicate that groundwater levels in the upper zone monitoring wells are approximately 65 feet below ground surface.

Prior to 1941, the Subject Property was undeveloped farmland. In 1941, the Subject Property was developed by a US government agency as an aluminum plant. DAC took over the facility in the 1950s and eventually purchased the property in 1970. Over the lifetime of the parcel, various additions, renovations, and new structures were added to the original two buildings that were constructed on the Subject Property.

Historical manufacturing activities on the Subject Property have included storage for aluminum forging operations, warehousing, and aircraft parts manufacturing. Hazardous materials have historically been used and stored on the site. Previous long-term handling and storage practices of hazardous materials and wastes are difficult to assess due to the age of the facility.

Kennedy/Jenks reviewed environmental records provided by DAC and performed a search of regulatory agency databases to identify properties in the vicinity that may impact the environment of the Subject Property. Though there are no underground storage tanks (USTs) presently on the Subject Property, seven USTs were removed from the Subject Property in 1987 and 1988. The records review revealed that groundwater beneath the Subject Property has been impacted by volatile organic compounds that may have originated from leaking USTs at the C-6 facility. However, results from a Phase II investigation in the parking lot suggests that VOCs may also be migrating onsite in shallow zone aquifers beneath the Subject Property from offsite sources.

2.0 INTRODUCTION

This report summarizes the results of a Phase I Environmental Site Assessment (PESA) of a parcel of the Douglas Aircraft Company (DAC) C-6 complex located at 19503 South Normandie Avenue in Torrance, California. The PESA was conducted by Kennedy/Jenks Consultants (Kennedy/Jenks) on behalf of McDonnell Douglas Realty Company (MDRC). The location of the C-6 complex is presented in Figure 1. A layout of the C-6 facility, including the area of the complex evaluated for the PESA (Subject Property), is presented in Figure 2. This summary Phase I document has been produced at the request of DAC, and does not include supporting data appended to the original report, "Phase I Environmental Assessment, Parcel A", submitted 20 March 1996.

2.1 Purpose

The MDRC is considering development of a parcel of the northern section of the DAC C-6 complex. MDRC retained Kennedy/Jenks to conduct a PESA regarding past and present operations in this section of the facility (Figure 2).

The findings of the PESA are based on site walk-throughs performed by Mr. Rick Pastore of Kennedy/Jenks while accompanied by McDonnell Douglas personnel on 27 and 28 December 1995, 4 and 12 January 1996, and 26 February 1996.

Supplemental information was obtained from interviews with DAC facilities personnel, from facility regulatory and environmental compliance documents provided by DAC Environmental Services, and from a review of available regulatory agency files.

2.2 Scope of Services

Kennedy/Jenks performed the following Scope of Services in conjunction with this PESA:

- Reviewed the history of the Subject Property. Historical information was obtained from interviews with DAC personnel, and a review of aerial photographs available from the Aerial Map Industries, Inc. collection in Irvine, California and the Spence collection and Fairchild collection at the University of California, Los Angeles.

- Reviewed available public records regarding previous environmental investigations and remediation activities at the Subject Property, inspection records, and groundwater monitoring reports obtained from DAC Environmental Services and regulatory agency data bases pertaining to site environmental compliance concerns at the Subject Property.

- Performed site walk-throughs of the Subject Property to observe current recognizable environmental conditions. The site walk-through focused on chemical handling, presence of storage tanks, hazardous substance and waste handling, and potential releases of hazardous materials on the Subject Property. In addition, Kennedy/Jenks performed a reconnaissance of the adjoining properties to identify potential impacts to the Subject Property.

2.3 Limitations and Exceptions of Assessment

The PESA is based on visual observations of existing site conditions, interviews of personnel familiar with the facility, and a review of relevant compliance documents and regulatory agency files. No environmental sampling or laboratory analyses were performed in conjunction with the PESA. The findings do not constitute a warranty, guarantee, or positive assertion as to the presence, absence, or extent of hazardous materials at the Subject Property. This PESA was prepared by Kennedy/Jenks for sole beneficiary use by the MDRC and is not intended to be relied on by others.

This PESA report represents Kennedy/Jenks' professional opinions and judgments, which are dependent upon information obtained during performance of consulting services. Environmental conditions may exist at the Subject Property which cannot be identified by visual observations only. The accuracy of information and data supplied by others has not been independently verified by Kennedy/Jenks during the performance of this PESA.

2.4 Methodology

This PESA has been prepared in accordance with standards set forth in ASTM Standard E-1527-93. These standards have been developed by ASTM to establish general site assessment practices that satisfy due diligence responsibilities of participants in real estate transactions.

3.0 SUBJECT PROPERTY DESCRIPTION

The following sections describe the Subject Property history and the geographic setting of the Subject Property. Subject Property history was compiled from DAC historical facility drawings, DAC environmental reports, interviews with DAC employees, and a review of available aerial photographs.

3.1 Subject Property Description and History

The Subject Property is a portion of the DAC C-6 manufacturing complex located at 19503 South Normandie Avenue in Torrance, California (Figure 2). The topography of the facility is essentially flat with an elevation of approximately 50 feet above mean sea level (msl). The areas of the facility studied for this report include Buildings 29, 33, 34, 36, 37, 57, 58, 61, and 67, the northern section of Building 1, the north section of the employee parking lot, and the gravel yard to the east of Building 37 (Figure 2). Operations at the Subject Property consist of warehousing.

Aerial photos indicate that the Subject Property was farmland prior to the 1940s. The Subject Property was first developed by the Defense Plant Corporation in 1941 as part of an aluminum reduction plant. The plant was operated by the Aluminum Company of America until late 1944 (CDM, 1991). In 1948, the property was acquired by the Columbia Steel Company (CSC). In March 1952, the US Navy purchased the property from CSC and established DAC as the contractor and operator of the facility for the manufacturing of aircraft and aircraft parts. DAC purchased the property from the Navy in 1970 (CDM, 1991).

Manufacturing operations at the Subject Property have been inactive for approximately the last four years. Most of the manufacturing equipment has been removed from the facility. The following sections briefly describe the structures and evident previous activities performed in each building on the Subject Property.

<u>Building 1</u>

The portion of Building 1 included in Parcel A is a storage area for magnetic computer tapes. An electrical transformer station is located on a mezzanine level accessible by ladder. The transformers are labeled as containing PCBs.

Building 29

Building 29 is located on the eastern half of the Subject Property and extends from the southern boundary to the northern boundary. The southern half of this building was a machine and carpentry shop. The northern half is presently used for government property storage and was not inspected. Hazardous materials were stored in a painting area on the east side of the building. An air scrubber system and a clarifier were also noted in the painting area. The clarifier appeared to have three stages. The covers to the clarifier were welded shut. Paint was kept in storage lockers on the exterior of Building 29 near the paint booth.

According to DAC personnel, the paved yard between Building 29 and Building 1 and north of Building 32 was used for hazardous materials and hazardous waste storage. Portable tanks parked in this area were labeled to contain waste coolant. The asphalt in this area appeared in good condition with limited staining, though several patches, some large, were observed. DAC personnel also stated that a concrete pad with a containment curb at the northeast corner of the yard was used as a hazardous waste accumulation area. A structural steel frame suggests there may have been a lean-to type of building in place at one time. The concrete appeared to be in good condition with few cracks and no surface staining. Three cores in the concrete were apparently cut, as evidenced by anchor bolt taps for a concrete coring saw. The holes appear to have been capped with the cores.

Building 33

Building 33 is an empty storage shed. The shed was previously used to store cyanide.

Building 34

Building 34 is a 22,052 square foot brick structure located near the south-central portion of the Subject Property. According to DAC personnel, this building was originally a commissary. Sometime during the 1970s, the building was converted into a machine shop and engineering offices.

Building 36

Building 36 was formerly used as a paint and solvent storage area for the DAC facility. The building is presently used for the storage of used aircraft interiors.

Building 37

Building 37 is a 183,516 square foot building located in the center of the Subject Property. The south end of the building was built during the initial development of the property in 1941. The northern half of the building was added on to the original portion in 1968. The majority of the structure is open to a height of approximately four stories. A small section of the eastern portion of the building houses four floors of offices.

There are presently no manufacturing operations in this building. Previous industrial activities included the operation of a foundry in the south central portion of the building and the operation of large machine presses and lathes throughout the building. All of the foundry equipment has been removed. Machines in the north section of the building were housed in large pits approximately 8 feet deep, 20 feet wide and 60 feet long. Most of the machines that were housed in the pits have been removed. At the time of the site walk-throughs, some of the pits had been filled with soil and capped with concrete. On-going steam cleaning operations of other pits were also evident. According to DAC personnel, machine lubricant and aluminum cuttings would fall from the machines into the pits. The lubricant drained to a sump for recycling into the machine's cooling system. The cuttings would be periodically removed by DAC employees. A ground floor room on the east side of the building housed the tooling department where employees would produce parts for the various machines in the rest of the facility. A parts cleaning tank in this room was labeled with 1,1,1-trichloroethane (TCA). The tank appears to sit within a sump.

The demolition drawings for the addition to the north end of Building 37 show a pre-existing underground butylene line entering the Subject Property from the east and turning under Building 37 to the northwest. The as-built drawings show that the butylene line was encased in the foundation. The drawings do not indicate the source, destination, or size of the pipeline. Detail sheets showing the encasement were missing from the drawings. No other information was available from the drawings concerning the butylene line. DAC personnel were not aware of any butylene uses at the facility.

Building 57

Building 57 is a 12,872 square foot structure built between 1945 and 1956. Present activities consist of aircraft parts storage. DAC personnel indicated that this building has always been used for storage and that there were no manufacturing activities in this building in the past.

Building 58

Building 58 is a steel frame lean-to type building with three walls and a roof. The east side of the structure is the open side. This area was used for motor vehicle storage and maintenance operations. Significant oil staining of the surface was observed in many areas under the roof. Aerial photos indicate that this structure was constructed in the early 1950s.

Building 61

Building 61 is a 82,030 square foot structure that housed the DAC plastic parts manufacturing operations. The southern section of the building was built between 1945 and 1956. The northern section of the building was built in 1968. Several paint booths and large ovens were observed in this building. One hydraulically-powered elevator was observed at both the north and south entrances to the building. The southeast corner of this building is used for the storage of US government property.

Building 67

Building 67 is a 113,433 square foot building that housed aircraft part finishing processes and inspection. This building was built in 1968. A pit in the southeast corner of the building housed an electronic discharge machine which used high voltage electricity and dielectric oils to remove machine burrs from aircraft parts. The pit is approximately 10 feet wide, 25 feet long, and 10 feet deep.

A room located in the central west section of the building housed a parts treatment process line consisting of five dip tanks and a large solvent degreasing bath. The dip tank labels indicate that they contained rinse solutions and treatment baths such as sodium chromate and sulfuric acid. The solvent degreasing bath sits in a concrete pit. DAC documents indicate that the solvent tank has a capacity of 1,200 gallons and contained 1,1,1-TCA. DAC personnel indicated that solvent for the tank was stored in a chemical storage area in another section of the facility that is outside of the Subject Property area. When the solvent needed to be changed, it would be brought to the degreaser in a portable tank.

Two x-ray booths and darkroom facilities are located in the east central portion of the building. Four autoclaves located at the north end of the building were used to heat treat aircraft parts. A room on the east side of the building housed several large air compressors. The air compressors have been removed. Oil stains were observed on the floor and in three floor drains in this room. Abandoned cooling towers were observed near the exterior of the southeast corner of the building and near the northeast corner.

The aerial photographs show that this building was developed along with the additions to Building 61 and 37 in the late 1960s. According to DAC personnel, it previously housed machinery disassembly operations.

Gravel Yard east of Building 37

The area to the east of Building 37 is a storage yard for miscellaneous materials and parts from the manufacturing operations of the facility. With the exception of some asphalt paving directly adjacent Building 37, the yard is covered with a gray pea gravel. A rail spur crosses the yard to the north along the edge of the asphalt pavement to the east of Building 37. Two 5,000 barrel steel aboveground storage tanks (ASTs) used for emergency water storage sit beside a 745 square foot pump house. The soils adjacent to the tank have been excavated to act as a secondary containment area for the tanks. A small shed near the northeast corner of the Subject Property provides access to the sanitary sewer. To the east of the shed is the facility storm drain outfall to the storm sewer system. All storm water from the C-6 complex passed through this sump. According to DAC personnel, employees would periodically turn on a skimmer pump to remove any oil from the top of the sump. The fluids were pumped to the surface for further polishing in an oil-water separator.

A review of DAC historical drawings indicates that the ASTs were previously used for diesel oil storage. The aerial photograph review and the historical drawings indicate that a railroad spur crossed the area of the present gravel yard from the southeast corner of the yard and around the present location of the northeast corner of Building 37. A transfer station existed on the spur to the southwest of the tanks. The drawings indicate two pipelines leading to the tanks from the west noted as "6 inch pipe from cars" and "3 inch line to plant", and one pipeline leading to the tanks from the east noted as "8 inch line from boat."

The aerial photographs do not indicate the presence of any other past structures in this area of the Subject Property.

Employee Parking Lot

Part of the employee parking lot was built during the initial development of the Subject Property in 1941. The parking lot was enlarged to the north sometime during the 1960s.

Lighting for the parking lot is provided by lights mounted on two steel frame towers. The aerial photograph review did not indicate the presence of any other past structures on this portion of the Subject Property.

Groundwater Monitoring Wells

Four groundwater monitoring wells located on the Subject Property are part of a quarterly groundwater monitoring program implemented by DAC to evaluate chemical transport in shallow zone aquifers beneath the C-6 facility (Figure 2). The four wells, constructed with 4-inch diameter Schedule 40 PVC, each have a total depth of approximately 90 feet bgs, except for well WCC-3D, which has a total depth of approximately 120 feet bgs.

Well WCC-3D is located in the breezeway between Building 1 and Building 36. Well WCC-11S is located in the gravel yard east of Building 37 and west of the emergency water ASTs. Well WCC-2S is in the southern section of the paved area between Buildings 34 and 61. Well WCC-10S is located near the northwest corner of the employee parking lot. All three wells are locked, capped with flush-mounted Christy boxes, and labeled as monitoring wells.

One groundwater monitoring well and two piezometric wells are located in the breezeway between Buildings 1 and 36. According to DAC Environmental Services, these wells were installed by Montgomery Watson during a geotechnical investigation. The piezometric wells do not penetrate groundwater. None of the wells are tested or sampled regularly.

3.2 Adjoining Properties

The Subject Property is bordered by 190th Street on the north, South Normandie Avenue on the east, the remainder of the C-6 facility on the south, and a former metals plant (Industrial Light Metals) to the west. A railroad easement is located between the fence on the east side of the property and Normandie Avenue. The surrounding properties consist mainly of light industrial and manufacturing facilities and office buildings.

An aerial photograph from the Spence collection indicates that the surrounding properties were farmland as late as 1933. Sometime later during the 1930s, industrial development began to the southeast and south of the Subject Property. The records review indicates that the Montrose Chemical Plant produced pesticides in a facility located adjacent to the C-6 facility to the south. A large rubber production facility was located to the southeast across South Normandie Avenue. Photographs from 1941 and 1945 indicate that the property to the west of the C-6 facility was first developed as a rubber plant during that time period. Subsequent photographs indicate that this facility underwent several additions and renovations up to the 1990s. A large manufacturing plant was developed to the east of South Normandie Avenue sometime between 1945 and 1956. Photographs from the 1960s to the present show that there was much development and industrial redevelopment of the areas surrounding the C-6 facility.

Present development to the north of 190th Street consists of office buildings. An office building located at the northeast corner of 190th Street and South Normandie was built in 1986. Properties to the east of the Subject Property across South Normandie include a Texaco gas station, a cement plant, a bakery, an office building, and an auto repair shop. Demolition activities are on-going at the Industrial Light Metals facility to the west. Nearly all aboveground structures have been removed from that site.

C-6 facility operations to the south of the Subject Property included a boiler house in Building 41, and aircraft parts were manufactured in Building 1 (Figure 2). A compressor is currently operational Building 41. DAC records indicate that two underground storage tanks (USTs) were removed from the north side of Building 41. According to DAC personnel, areas between Building 1 and Building 29 were used for hazardous waste and hazardous materials storage.

3.3 Site and Regional Geology and Hydrogeology

The following sections describe the Subject Property and regional geology and hydrogeology.

Subject Property and Regional Geology

Kennedy/Jenks reviewed boring logs from the demolition plans of Building 67 dated 2 February 1968 and a Phase II subsurface soils investigation performed in 1991 (CDM, 1991). The reports show that the Subject Property is underlain by fine-to medium-grained sand, silty sand, and clayey sand. Borings from both investigations were advanced to a depth of approximately 30 feet below ground surface (bgs).

Regionally, the Subject Property is located in the Torrance Plain. Subsurface sediments in this region consists mainly of Recent alluvial deposits of gravel, sand, clay, and silt to a depth of approximately 175 feet bgs.

Subject Property and Regional Hydrogeology

According to Department of Water Resources (DWR, 1961), the Subject Property is located in the Torrance Plain and underlain by the Bellflower Aquitard in the upper approximately 100 feet bgs and by the Gage Aquifer, a water-bearing zone within the Lakewood Formation, from approximately 110 to 160 feet bgs. The Lakewood Formation extends to a depth of approximately 175 feet bgs. Beneath the Lakewood Formation is the San Pedro Formation, which extend to a depth of approximately 1,000 feet bgs. Water-bearing zones in this formation consists of the Lynwood Aquifer from approximately 300 to 390 feet bgs and the Silverado Aquifer from approximately 400 to 670 feet bgs (DWR, 1961). The Silverado Aquifer is considered a source of drinking water.

According to recent groundwater monitoring performed by Kennedy/Jenks for DAC (Kennedy/Jenks, 1996), local groundwater elevations range from approximately 15.5 feet to 16 feet below msl. Recent and historical data suggests that the groundwater flow direction is to the southeast.

Groundwater samples collected from the network of wells at the C-6 facility, including three on the Subject Property, indicate that the shallow zone aquifer at approximately 60 to 90 feet bgs has been impacted by chlorinated and non-chlorinated volatile organic compounds (VOCs). Concentrations of trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE) detected in the wells on the Subject Property ranged from 35 micrograms per liter (ug/L) to 210 ug/L in a recent sampling event (Kennedy/Jenks, 1996). Quarterly monitoring dating back to 1987 for well WCC-2S, 1989 for well WCC-10S and 1991 for well WCC-11S, does not show significant changes in chemical concentrations. Historical data indicates that concentrations of chloroform are occasionally detected in well WCC-10S at concentrations slightly above the detection limit of 2 ug/L. Concentrations of cis-1,1-dichloroethene are periodically detected in well WCC-11S at concentrations ranging from 2 to 5 ug/l.

VOCs found in the groundwater beneath the Subject Property may have originated from known sources within the C-6 facility and from sources upgradient from the C-6 facility.

Four USTs containing solvents were removed from the area between Buildings 1 and 36 in September 1991. Releases from these USTs or previous USTs at this location are believed to have impacted groundwater.

In a technical memorandum dated 5 July 1994, Kennedy/Jenks reviewed available environmental regulatory agency files to evaluate the potential for the onsite migration of VOCs from offsite sources. In the memorandum, Kennedy/Jenks identified three sites where subsurface releases of VOCs may have migrated onto the Subject Property. Industrial Molding Company (IMC), located at 2015 West 190th Street, is located approximately 3/4-mile west and upgradient of the C-6 facility. Previous operations at the IMC facility produced paint sludges, polymeric resin wastes, oil/water sludges and metal dust. Risto-Los Angeles, located at 1441 West 190th Street and north of the C-6 facility, manufactures industrial and refrigeration machinery and equipment. The California Department of Toxic Substance Control identified Risto as a site for preliminary environmental assessment. The potential impact of this location on the Subject Property is not known. ILM, located at 19200 South Western Avenue, is adjacent to the Subject Property to the west. Wastes generated at the ILM facility included spent acidic and caustic sludges, spent petroleum solvents, polychlorinated biphenyls (PCBs) and spent

1,1,1-TCA. Both petroleum solvents and chlorinated solvent were stored in USTs at the site.

4.0 ENVIRONMENTAL RECORDS REVIEW

The following section summarizes information obtained during the review of available regulatory agency database listings and facility records supplied by DAC.

4.1 Regulatory Agency Records Review

Kennedy/Jenks conducted a review of available environmental regulatory agency database listings for references to the Subject Property and to evaluate the presence of adjoining properties that may be of interest to the Subject Property. Kennedy/Jenks retained Vista Environmental Information, Inc. (Vista) to assist with the database listing search.

Vista performed a review of 17 pertinent environmental regulatory agency databases. The database search included 141 references within five-eighths of a mile of the Subject Property (including the Subject Property), 27 references within five-eighths to three-quarters of a mile, 22 references within three-quarters to one mile, and eight references within one to one and one-half miles. The C-6 facility appeared on seven of the databases searched:

- A reference to DAC exists in an EPA database list of large quantity generators who generate at least 1000 kilograms per month of hazardous waste.

- The C-6 complex appears on both a state and regional database listing of sites with leaking USTs. Both references indicate that groundwater was impacted by solvents.

- There are three references to the C-6 facility on the state database list of facilities with USTs. The three references indicate an inconsistent number of USTs at the C-6 facility.

- The C-6 facility appears on the CERCLIS list, an EPA-maintained database which lists sites where releases have either been addressed or need to be addressed. CERCLIS sites designated as "No Further Remedial Action Planned (NFRAP)" may be sites where an initial investigation found that there were no environmental impacts, environmental impacts were removed quickly without need for the site to be placed on the NPL, or the environmental impact was not serious enough to require NPL consideration. The database reference indicates that the C-6 facility is a NFRAP site.

- Four references were recorded on the Emergency Response Notification System (ERNS) database. The ERNS database is a collection of reported releases of oil or hazardous substances made to federal authorities including the EPA, the US Coast Guard, the National Response Center, and the Department of Transportation. Two of the references are linked to a release of an unknown amount of nitrogen dioxide gas on 15 December 1993. The third reference is related to a spill of an unknown amount of a petroleum hydrocarbon. The fourth reference is related to a spill of hydrofluoric acid. In all of the cases, the agency to which the release was reported was not included in the database information.

Several properties adjacent to the C-6 facility appeared in the database listings.

- Lawson Enterprises, Inc., located at 19500 South Normandie Avenue, is on the database list of proposed, current, or deleted NPL sites. The database listing indicates that no further remedial action was planned as of 1 June 1986. Jay Steinbeck is noted on the state-maintained list of USTs at the same address as Lawson Enterprises. This site is located east of the Subject Property across South Normandie Avenue.

- Pacific Gateway at 19525 South Normandie is referenced on a database list of small quantity hazardous waste generators. This site is located east of the Subject Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- Alpine Foreign Car Service at 19530 South Normandie Avenue is referenced on the database list of large quantity generators. This site is located east of the Subject Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- The Del Amo Facility, a 3.7 acre area approximately one-quarter mile to the southeast of the Subject Property, appears on the EPA's National Priority List, California Department of Toxic Substances Control's State Priority List, and on the CERCLIS list. The database listing indicates that EPA has taken regulatory responsibility for the site and that remedial investigations are currently under way. The Del Amo facility was used as a waste disposal area for local rubber manufacturers from 1942 to 1969. Sampling of groundwater at the Del Amo site has indicated the presence of polynuclear aromatic hydrocarbons and VOCs in the groundwater (Kennedy/Jenks, July 1994). The VISTA map illustrates both the area of the site and offsite areas being screened as part of the site assessment.

- The site at 1225 West 196th Street is referenced six times in the databases reviewed. This site borders South Normandie Avenue to the west and is southeast of the Subject Property. American Polystyrene appears on the database list of large quantity hazardous waste generators and on a database registry of users of hazardous chemicals known as the Toxic Release Inventory System (TRIS). The TRIS reference indicates that chemicals used at the site include styrene and ethylbenzene. Amoco Chemicals at the same address appears on the EPA CERCLIS list, the state CERCLIS list, and on the CORTESE list, a state-maintained list of sites with hazardous materials releases. Amoco is also on the ERNS list for a 5,000 pound release of styrene gas on 7 September 1990.

- Greene's Ready Mix Concrete at 19030 South Normandie Avenue appears on a state-maintained list of UST owners and on a state-maintained list of leaking UST owners. The leaking UST reference indicates that the release was cleaned up and that the case has been closed. This site is located to the east of the Subject Property across South Normandie Avenue.

- A Texaco station located at 19008 South Normandie appears on the state-maintained list of UST owners. The gas station is located east of the Subject Property on the southeast corner of West 190th Street and South Normandie Avenue.

- South Bay Corp. at 1411 West 190th Street appears on the state-maintained list of leaking UST owners, a regional list of leaking UST owners, and on the CORTESE list. The database references indicate that a UST containing diesel has released an unknown quantity of fuel. The references also indicate that no remedial actions have been taken by the responsible party. This site is north of the Subject Property across West 190th Street.

- The facility adjacent to the Subject Property to the west, located at 19200 South Western Avenue, appears on seven databases. The site appears twice on the CORRACTS list, a list of facilities which have received a corrective action order from the EPA due to a release of hazardous materials or wastes into the environment. The CORRACTS reference for a Northrop Corporation at this site indicates that no further action is necessary. The CORRACTS reference for a Martin Marietta facility at this location indicates that further corrective action is necessary, but that the site has a low prioritization status. The site also appears on the CERCLIS list and the state-equivalent CERCLIS list. The database listing on the CERCLIS list indicates that the site is undergoing preliminary assessment activities; the database listing for the state listing indicates that no further action is required at the site. The site appears again on the CERCLIS list as Martin Marietta Aluminum. This reference indicates that the site is still in discovery status. The site appears on the state lists of aboveground storage tanks (ASTs) and USTs; no further information about the site is available from these reference listings. Six references in the ERNS database shows that the following releases of hazardous materials occurred:

  An unknown amount of waste oil and lubricants were spilled on the site on 1 February 1990.

400 gallons of oily water were spilled on 3 August 1990. This incident has two listings in the ERNS database.

900 gallons of chromic anhydride were discharged to the sewer system on 25 October 1991.

100 gallons of oil were spilled on 29 May 1990. (This incident has two listings in the ERNS database.)

- The Montrose Chemical facility located approximately three-eighths of a mile to the south of the Subject Property and directly adjacent to the C-6 facility appears on five databases. The site is listed on the NPL, SPL, and CERCLIS list. The site is currently on the NPL due to releases of DDT to groundwater.

4.2 DAC Documents

Kennedy/Jenks reviewed environmental documents for operations at the C-6 complex supplied by the DAC Environmental Services. These documents included UST removal reports, remediation reports, site assessment reports, historical drawings, an AST inventory list, and a technical memorandum. The following summarize the findings of the document review process that pertain to the Subject Property.

UST Removal Reports

Kennedy/Jenks reviewed several UST removal reports for USTs removed from the C-6 complex, including eight removed from the Subject Property.

Tank 8T, a 10,000 gallon waste coolant tank, was removed in March 1987. Some soils surrounding the tank had been impacted by petroleum hydrocarbons, but confirmation sampling following further excavation indicated that remaining petroleum hydrocarbon concentrations were below regulatory action levels. (Woodward Clyde, 1988).

Tanks 35T and 36T, both 550 gallon single-walled steel gasoline tanks were removed in 1987. Tank 35T was located on the east side of Building 67. Tank 36T was located on the east side of Building 61 near the northeast corner (Crosby and Overton, 1988).

Tank 37T was a 130 gallon diesel tank located on the north side of Building 1. Analysis of soil samples collected from beneath the tanks indicated that concentrations of benzene, toluene, ethylbenzene, xylenes, petroleum hydrocarbons, and total lead were below regulatory action levels. (Crosby & Overton, 1988).

Tanks 15T, 16T, 17T, and 18T were removed in 1991. Tank 15T was a 3,000 gallon waste solvent tank. Tanks 16T, 17T, and 18T were 5,000 gallon solvent storage tanks. The four tanks were located in the exterior breezeway to the south of Building 36 and north of Building 1. Analysis of soil samples collected from beneath the tanks indicated that the surrounding soils had been impacted by petroleum hydrocarbons and VOCs. The impacted soils were left in place for future management by DAC (Emcon, 1992). During further assessment of the impacted area, Montgomery found soils impacted by TCE and MEK at up to 60 feet bgs. Montgomery estimates that the lateral extent of impact extends in a southeast direction beneath Building 1 (Montgomery, 1994). Remediation activities are on going.

Remediation Reports

Kennedy/Jenks reviewed a soil remediation report prepared by Environmental Science & Engineering (ESE) dated 9 November 1995. According to the report, approximately 60 gallons of dielectric oil were spilled during the dismantling of an electrical transformer adjacent to Building 61. The dielectric oil contained polychlorinated biphenyls (PCBs). DAC hired a remediation contractor to remove impacted concrete and soils, and retained ESE to perform verification sampling of the cleanup activities. ESE found that further excavation of PCB-impacted soils was necessary and excavated approximately 15 additional cubic yards of soil. Analytical results of sampling following ESE's excavation indicated that remaining PCB concentrations were below regulatory cleanup levels.

Site Assessment Reports

Kennedy/Jenks reviewed separate Phase I and Phase II site assessments performed by CDM for DAC in 1991. A Phase I was performed for two parcels at the C-6 complex: the northern parking lot that is part of the Subject Property and the tool storage yard located to the southwest of the C-6 complex. CDM concluded that neither of the parcels appeared to have been used for the generation or storage of hazardous wastes or substances. Based on groundwater monitoring results that showed elevated concentrations of TCE , CDM recommended sampling along the western fence of the parking lot to investigate the possibility that activities at the adjacent facility to the west had impacted the subsurface beneath the Subject Property.

For the Phase II assessment, CDM advanced 3 soil borings in the parking lot to a total depth of 31.5 feet bgs. The soil samples were analyzed VOCs, priority pollutant metals, PCBs, and organochlorine pesticides. Based on the analytical results that showed all analytes at concentrations below regulatory limits, CDM concluded that further investigation of the parking lot subsurface was not necessary.

Kennedy/Jenks reviewed field notes and laboratory analytical reports for soil samples collected from beneath the concrete pad that was used as a hazardous waste accumulation area between Building 29 and Building 1. The field notes state that soils were collected from three locations from approximately one foot beneath the concrete. The individual samples were combined, and a composite sample from the mixture was sent to an analytical laboratory for analysis of total chromium, hexavalent chromium, lead, zinc, and total cyanides, and VOCs by EPA Method 8020. Metals concentrations were within expected natural ranges. Chemical constituents detected in the sample included cyanide (0.053 mg/Kg), 1,2-dichloroethane (0.05 mg/Kg), 1,1,1-TCA (17 mg/Kg), 1,1,1,2-tetrachloroethane (0.21 mg/Kg), and toluene (0.03 mg/Kg).

Historical Drawings

Historical drawings provided by DAC included an Aluminum Company of America (ALCOA) drawing dated 25 February 1942 entitled "Bldg. #68 - 5000 bbl. Fuel Oil Tanks and Pump House Foundations - Plan and Details, another ALCOA drawing dated 3 May 1943 entitled "D.P.C. - Fuel Storage Tanks - Their Location", a DAC drawing originally dated 3 September 1963 entitled "Master Shore Station Development Plan", and as-built drawings and demolition plans for the additions performed on the Subject Property dated May 1968.

The 1942 drawing shows the AST tank plans. As titled, the drawing indicates the layout of the two 5,000 barrel diesel storage tanks and piping. One pipeline enters the pump house from the east and is labeled "8 inch pipe from boat." Two pipelines enter the pump house from the west. One is marked as "6 inch pipe from cars"; the other is labeled "3 inch pipe to plant".

The 1945 drawing shows the location of USTs at the entire facility. Three USTs were present on the Subject Property at that time in the following locations:

- One 10,000 gallon diesel UST was located 120 feet north of the end of Building 44 (present-day Building 29). In 1945, Building 29 was called Building 44 and was considerably shorter than the present-day structure.

- One 1,175 gallon fuel oil tank was located four feet from the north side of then-called Building 44.

- One 1,000 gallon fuel tank was located in the roadway on the south side of Building 29.

The original 1963 Shore Station Development Drawing does not indicate the location of the USTS shown on the 1945 drawings.

Other structures shown on this drawing in the area of the Subject Property are a "carbon material storage" building (presently known as Building 37) and a "butt storage" building (presently Building 34).

The original 1963 Shore Station Development Drawing shows the location of the rail line that crossed the Subject Property prior to the additions and renovations performed in the late 1960s. The details show the location of the underground fuel lines leading from a rail car transfer station to the pump house and the lines leading from the pump house to the boilers. The same drawing revised in 1978 shows that the rail lines were removed and that Buildings 37 and 61 were enlarged.

DAC provided Kennedy/Jenks with a set of demolition plans and as-built drawings for the additions and renovations that were performed on the Subject Property in the late 1960s. The set of drawings were not complete, but two items of potential environmental interest were noted:

- An as-built drawing entitled "Foundation and Floor Plan", dated 22 May 1968, shows an encased butylene line beneath the floor near the north end of Building 37. DAC personnel were not aware of the butylene line and could not recall any butylene uses when the C-6 complex was in full operation.

- An as built drawing entitled "Site Utility Plan", dated 2 December 1968, shows a sump tank near the northeast corner of Building 61. During the site walk-throughs, this sump was not located, but a rectangular asphalt patch was noted in the area where the map indicates the sump was located. DAC personnel could not recall the presence of a sump at this location, but the asphalt patch corresponds with the location of removed UST 36T.

AST Inventory List

DAC provided Kennedy/Jenks with an inventory of ASTs at the C-6 complex that was compiled in 1989. The list detailed tank sizes, locations, and contents. The following tanks may present potential environmental interests or could be related to processes of interest:

- A 20 gallon solvent cleaner tank was located in Building 37 near column 37-C-32;
- A 600 gallon heat treating tank containing sodium cyanide solutions was located in Building 37 near column 37-C-22;
- A 2,110 gallon aluminum cleaning tank containing sodium chromate was located in Building 67 near column 67-L-15;
- A 2,200 gallon aluminum etching tank containing sulfuric acid was located in Building 67 near column 67-L-15;
- A 320 gallon degreasing tank containing 1,1,1-TCA was located in Building 67 near column 67-L-15;
- A 1,300 gallon tank containing dielectric oil was located in Building 67 near column 67-C-33; and
- A 1,200 gallon degreaser tank containing 1,1,1-TCA was located in Building 67 near column 67-C-33.

Technical Memorandum

A technical memorandum written by Kennedy/Jenks and dated 5 July 1994 summarizes the result of an assessment for the potential onsite migration of VOCs from offsite areas. The report identified three sites with a potential to impact groundwater quality beneath the Subject Property.

The three sites identified in the report were:

- the former ILM facility adjacent to the Subject Property to the west;

- the Industrial Molding Corporation facility located approximately 3/4-mile west of the Subject Property; and

- the Risto-Los Angeles facility located to the north of the Subject Property across West 190th Street.

The report suggested that an offsite source or sources have significantly contributed to high concentrations of solvents detected in a groundwater monitoring well located south of the Subject Property within the C-6 complex.

4.3 Sanborn Fire Maps

Kennedy/Jenks retained Vista to perform a Sanborn Map-Site Search for the Subject Property. Sanborn certifies that no Sanborn Maps are available for the Subject Property.

5.0 SITE WALK-THROUGH OBSERVATIONS AND INTERVIEWS

The following sections summarize observations and potential environmental interests noted during the site walk-throughs and during interviews with DAC personnel.

5.1 Hazardous Substance and Waste Handling

Manufacturing operations on the Subject Property have been discontinued. No ongoing usage or storage of hazardous wastes or materials were noted. DAC personnel indicated that large quantities of hazardous materials were previously stored in a chemical storage area in Building 36, located immediately south of the Subject Property.

In general, concrete floors throughout the Subject Property appeared in good condition. No concerns were noted in areas that seemed likely to have been material storage areas.

5.2 USTs, Sumps, and Clarifiers

No signs of USTs such as fill caps, pump islands, or vent lines were noted during the site walk-throughs. However, several sumps and clarifiers were noted at the following locations:

- A three-stage clarifier with the covers welded shut in the painting area of Building 29;
- A three-stage clarifier located to the south of a chip compactor on the east side of Building 37;
- A four-stage clarifier located on the east side of the chip compactor in Building 37;
- A three-stage clarifier inside a containment area near the northeast corner of Building 67;
- A sump located near the aluminum treating process lines in the central portion of Building 67.

DAC personnel could not recall what type of fluids were collected in each of the clarifiers and the sump. The clarifiers and the sump were not internally inspected.
DAC personnel indicated that a concrete patch on the north side of Building 34 resulted from the removal of a clarifier in this area. An asphalt patch observed near the northeast corner of Building 61 corresponds to the reported location of removed UST 36T.

5.3 ASTs

Because DAC is no longer performing manufacturing operations at the C-6 facility, most process equipment has been removed from the Subject Property.

Two 5,00 barrel ASTs are located in the gravel yard to the east of Building 37. Emergency water is presently stored in the tanks, though they originally contained diesel fuel.

One small AST was observed in the machine shop in the eastern part of Building 37. This tank, approximately 3 feet by 6 feet, sits in a pit of unknown depth. A label on the tank, possibly a parts degreaser, indicates that the contents of the tank at one time were 1,1,1-TCA.

ASTs were observed in the aluminum treating process line in Building 67. Five process tanks, one large rinse tank, and one degreasing tank were observed in this area. The five process tanks were aligned within a concrete secondary containment area. The concrete had minor staining and appeared corroded, particularly under the AST labeled as sulfuric acid and sulfuric dichromate.

5.4 Machine Pits

During full-scale operations in Building 37, large metal-working machines and presses sat in pits that were approximately 27 to 35 feet wide, approximately 180 feet long, and approximately 10 feet deep. As-built drawings dated 1968 indicate that there were seven of these machine pits in the north section of Building 37. Most of the machines have been removed from the facility, and cleaning and filling of the pits has started. In some cases, the pits have already been filled with soil.

According to DAC personnel, metal shavings and lubricating fluids would fall from the machines into the pits. The metal shavings would be periodically removed by workers, while the lubricant drained to a sump for continual recycling into the machine.

5.5 Asbestos-Containing Materials

A survey for potential asbestos-containing materials was not performed as a part of this PESA. In a report dated 9 February 1990, Hall-Cimbrell Environmental Services, Inc. reported that asbestos-containing materials were present on the property.

5.6 PCBs

Fluorescent light ballasts and electrical transformers manufactured prior to 1977 may contain oils with PCB concentrations requiring special management. Electrical transformers may also contain oils with PCB concentrations requiring special management.

Fluorescent light ballasts that appeared to be manufactured prior to 1977 were observed throughout the Subject Property.

All electrical transformers at the C-6 facility have been labeled as tested for the presence (or non-presence) of PCBs. Transformer stations on the Subject Property that were labeled as containing PCBs were:

Near the southwest exterior corner of Building 37;
At the west central portion interior of Building 61; and
Along the exterior of the east side of Building 67;
On the northern mezzanine in Building 1.

The concrete pads at the transformer stations at Buildings 37, 61, and 67 appeared in good condition with no staining or cracking.

5.7 Lead-Based Paint

Based on the age of the Subject Property, lead-based paints are likely present.

6.0 CONCLUSIONS

Numerous areas of environmental interest were identified during the PESA. These areas relate to past manufacturing processes, hazardous materials usage areas, clarifiers, pipelines, areas identified on facility drawings and impact from adjacent properties.

Subsurface soils and groundwater have been impacted by releases from former USTs located between Building 1 and 36.

At the following areas on the Subject Property, there is a possibility that any release of a hazardous substance could have impacted surrounding soils:

- A three-stage clarifier with the covers welded shut in a painting area of Building 29.

- Three USTs noted in historical drawings as being in operation around Building 29 in 1945. No records of the removal or final disposition of the tanks exists.

- Cyanide storage in Building 33;

- A concrete patch on the north side of Building 34 that represents the former location of clarifiers;

- Machine pits and coolant collection sumps in Building 37;

- A solvent tank located in the tool room in the eastern section of Building 37;

- A butylene line noted on historical facility drawings beneath the north end of Building 37;

- Two hydraulically-powered elevators in Building 61;

- A collection sump noted on historical drawings near the northeast corner of Building 61;

- A machine pit in the southeast corner of Building 67.;

- A process line room in the west central portion of Building 67;

- Sewer lines from the dark room area in Building 67;

- Oil-stained floors and oil-stained floor drains in the former air compressor room in Building 67;

- Clarifiers observed during the site walk-throughs;

- Two former diesel ASTs, diesel transfer pipelines coming onto the Subject Property and within the Subject Property, and a former rail car transfer station to the southwest of the ASTs;

- ASTs noted on a 1989 DAC AST list;

Building materials and structures that may require proper disposal were noted in the following areas:

- X-ray booths in Building 67 that may be constructed with lead;

- Abandoned cooling tower construction materials on the east side of Building 67;

- Potential asbestos-containing materials;

- Three transformer stations labeled as containing PCB-laden oils;

- Lead-based painted building materials.

Laboratory analysis of soil samples collected from a former hazardous waste storage area near the northeast corner of Building 29 indicates that the subsurface soils have been impacted by VOCs at concentrations below regulatory action levels.

The Subject Property and several adjacent properties appeared on regulatory agency databases. Adjacent properties with environmental conditions that may impact the Subject Property include the ILM facility to the west, and the South Bay Corp. to the north.

Two EPA Superfund sites are located near the Subject Property:

- The Del Amo facility is a 3.7 acre area approximately one-quarter mile to the southeast;

- The Montrose Facility is located approximately 1/4-mile to the south of the Subject Property but adjacent to the C-6 facility.

VOC concentrations detected in groundwater samples collected from three monitoring wells on the Subject Property may have originated from releases of hazardous materials during manufacturing operations on the Subject Property and/or from offsite sources. Previous subsurface investigations in the employee parking lot suggest that VOCs are also migrating onto the Subject Property from an offsite source to the west.

It is likely that previous manufacturing operations have impacted the subsurface environment of the Subject Property. It is also possible that operations at adjacent properties, including other sections of the C-6 facility to the south, have impacted the subsurface environment at the Subject Property.

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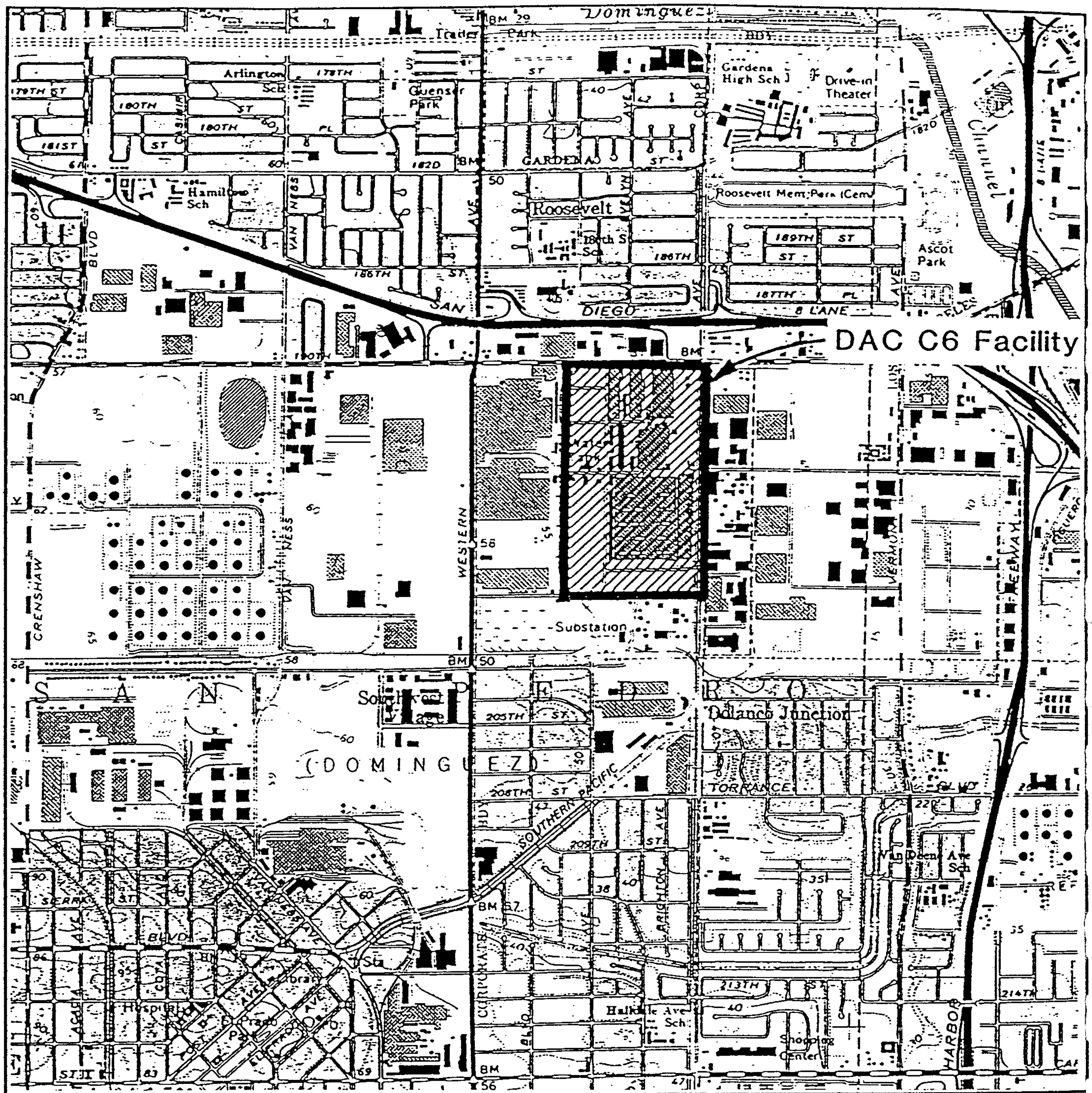


Base Map: U.S.G.S. 7.5 Minute Topographic Map,
Torrance, California Quadrangle, 1981.

0 2000 4000

Approximate Scale in Feet

N

Kennedy/Jenks Consultants

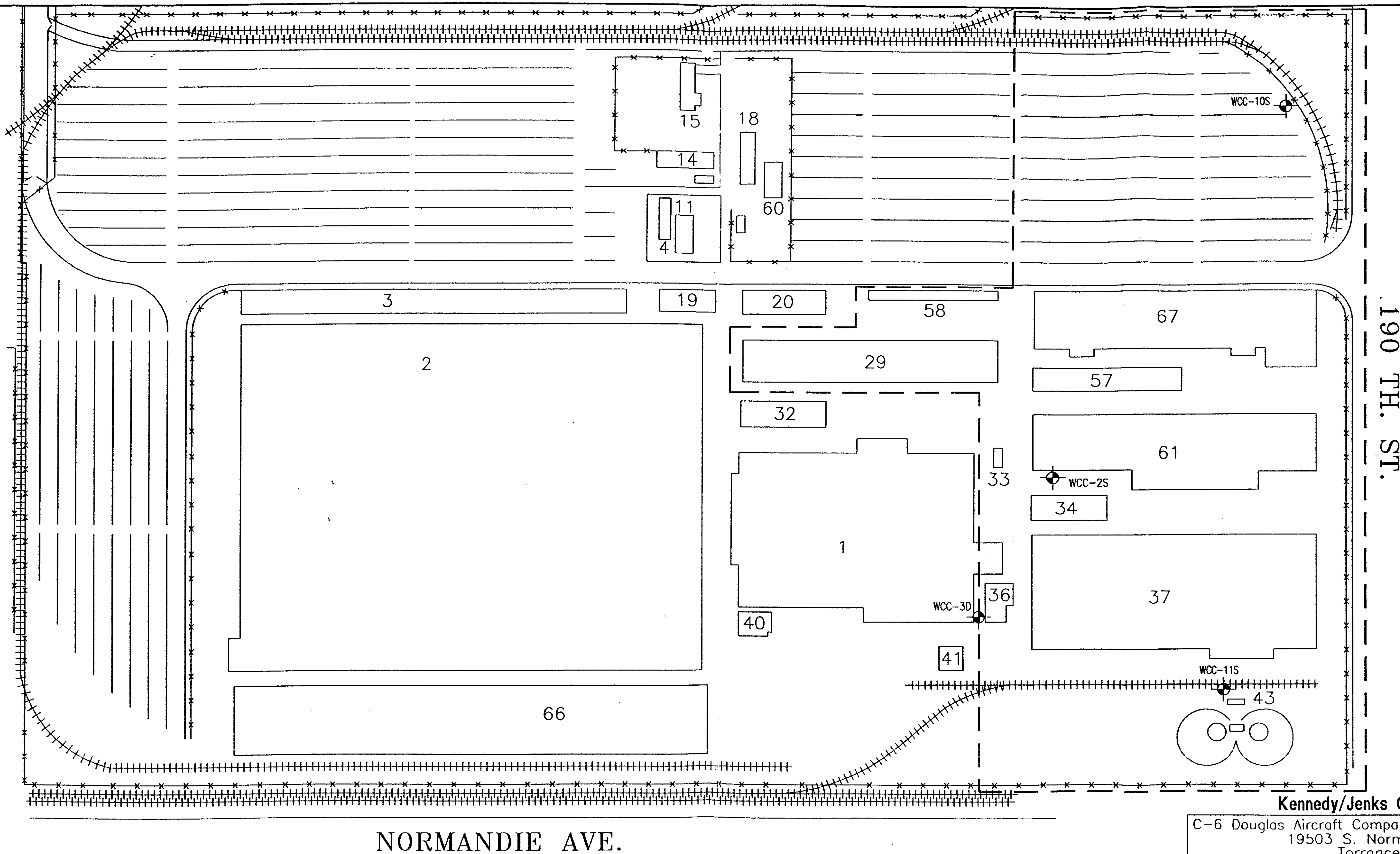
C–6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Site Vicinity Map

June 1996
K/J 954019.00

Figure 1

BOE-C6-0076062



0 200
Scale in Feet

N

LEGEND

Groundwater Monitoring Well Location

Approximate Subject Property Boundary

Kennedy/Jenks Consultants

C-6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Facility Layout and Subject Property Map

June 1996
K/J 954019.00

Figure 2

SUMMARY PHASE I ENVIRONMENTAL
ASSESSMENT
PARCEL B

MCDONNELL DOUGLAS REALTY COMPANY

JUNE 1996

K/J 954019.00

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1.0 EXECUTIVE SUMMARY

McDonnell Douglas Realty Company (MDRC) retained Kennedy/Jenks Consultants to perform a Phase I Environmental Site Assessment (PESA) on a parcel (Subject Property) of the Douglas Aircraft Company (DAC) C-6 Facility in Torrance, California. The parcel, Parcel B, is located in the west central portion of the facility and is bounded by the remainder of the C-6 facility to the south, east, and north, and by the Industrial Light Metals facility to the west. MDRC plans to redevelop Parcel B. Facility structures included in the Subject Property were Buildings 18, 20, 32, 60, 60A, 60B, and a portion of the employee parking lot. The area surrounding the C-6 facility consists mainly of light industrial and manufacturing facilities.

The C-6 facility is topographically flat, with an elevation of approximately 50 feet above mean sea level. The facility is located within the Torrance Plain and underlain by the Lakewood Formation which consists mainly of gravel, sand, clay, and silt. Water bearing zones beneath the parcel include the Lynwood Aquifer and the Gage Aquifer. The groundwater gradient is generally to the southeast. Recent groundwater elevation measurements indicate that the depth to groundwater is approximately 65 feet below ground surface.

Prior to 1941, the Subject Property was undeveloped farmland. In 1941, the Subject Property was developed by a US government agency as an aluminum plant. DAC took over the facility in the 1950s and eventually purchased the property in 1970. Over the lifetime of the parcel, various additions, renovations, and new structures were added to the original two buildings that were constructed on the Subject Property.

Historical manufacturing activities on the Subject Property have included storage for aluminum forging operations, warehousing, and aircraft parts manufacturing. Hazardous materials have historically been used and stored on the site. Previous long-term handling and storage practices of hazardous materials and wastes are difficult to assess due to the age of the facility.

Kennedy/Jenks reviewed environmental records provided by DAC and performed a search of regulatory agency databases to identify properties in the vicinity that may impact the environment of the Subject Property. Underground storage tank (UST) records indicate that at least eight USTs have been previously located on the Subject Property. Two of the eight remain in service today. The records review revealed that groundwater beneath the Subject Property has been impacted by volatile organic compounds (VOCs). Results from a Phase II investigation in the parking lot suggests that VOCs may be migrating onsite in shallow zone aquifers beneath the Subject Property from offsite sources.

2.0 INTRODUCTION

This report summarizes the results of a Phase I Environmental Site Assessment (PESA) of a parcel of the Douglas Aircraft Company (DAC) C-6 complex located at 19503 South Normandie Avenue in Torrance, California. The PESA was conducted by Kennedy/Jenks Consultants (Kennedy/Jenks) on behalf of McDonnell Douglas Realty Company (MDRC). The location of the C-6 complex is presented in Figure 1. A layout of the C-6 facility, including the area of the complex evaluated for the PESA (Subject Property) is presented in Figure 2. This summary Phase I document has been produced at the request of MDRC, and does not include supporting data appended to the original report, "Phase I Environmental Assessment, Parcel B", submitted in April 1996.

2.1 Purpose

MDRC is considering development of Parcel B, the west central section of the DAC C-6 complex. MDRC retained Kennedy/Jenks to conduct a PESA regarding past and present operations in this section of the facility (Figure 2).

The findings of the PESA are based on site walk-throughs performed by Mr. Rick Pastore of Kennedy/Jenks while accompanied by McDonnell Douglas personnel on 27 and 28 December 1995, and 4 and 12 January 1996.

Supplemental information was obtained from interviews with DAC facilities personnel, from facility regulatory and environmental compliance documents provided by DAC Environmental Services, and from a review of available regulatory agency files.

2.2 Scope of Services

Kennedy/Jenks performed the following Scope of Services in conjunction with this PESA:

- Reviewed the history of the Subject Property. Historical information was obtained from interviews with DAC personnel, and a review of aerial photographs available from the Aerial Map Industries, Inc. collection in Irvine, California and the Spence collection and Fairchild collection at the University of California, Los Angeles.

- Reviewed available public records regarding previous environmental investigations and remediation activities at the Subject Property, inspection records, and groundwater monitoring reports obtained from the DAC Environmental Services; and regulatory agency databases pertaining to site environmental compliance interests at the Subject Property.

- Performed a site walk-through of the Subject Property to observe current recognizable environmental conditions. The site walk-through focused on chemical handling, presence of storage tanks, hazardous substance and waste handling, and potential releases of hazardous materials on the Subject Property. In addition, Kennedy/Jenks performed a reconnaissance of the adjoining properties to identify potential impacts to the Subject Property.

2.3 Limitations and Exceptions of Assessment

The PESA is based on visual observations of existing site conditions, interviews of personnel familiar with the facility, and a review of relevant compliance documents and regulatory agency files. No environmental sampling or laboratory analyses were performed in conjunction with the PESA. The findings do not constitute a warranty, guarantee, or positive assertion as to the presence, absence, or extent of hazardous materials at the Subject Property. This PESA was prepared by Kennedy/Jenks for sole beneficiary use by MDRC and is not intended to be relied on by others.

This PESA report represents Kennedy/Jenks' professional opinions and judgments, which are dependent upon information obtained during performance of consulting services. Environmental conditions may exist at the Subject Property which cannot be identified by visual observations only. The accuracy of information and data supplied by others has not been independently verified by Kennedy/Jenks during the performance of this PESA.

2.4 Methodology

This PESA has been prepared in accordance with standards set forth in ASTM Standard E-1527-93. These standards have been developed by ASTM to establish general site assessment practices that satisfy due diligence responsibilities of participants in real estate transactions.

3.0 SUBJECT PROPERTY DESCRIPTION

The following sections describe the Subject Property history and the geographic setting of the Subject Property. Subject Property history was compiled from DAC historical facility drawings, DAC environmental reports, interviews with DAC employees, and a review of available aerial photographs.

3.1 Subject Property Description and History

The Subject Property is a portion of the DAC C-6 manufacturing complex located at 19503 South Normandie Avenue in Torrance, California (Figure 2). The topography of the facility is essentially flat with an elevation of approximately 50 feet above mean sea level (msl). The areas of the facility studied for this report include Buildings 18, 20, 32, 60, 60A, 60B, and the southern portion of the north employee parking lot. Operations at the Subject Property include aircraft parts assembly and warehousing.

Aerial photos indicate that the Subject Property was farmland prior to the 1940s. The Subject Property was first developed by the Defense Plant Corporation in 1941 as part of an aluminum reduction plant. The plant was operated by the Aluminum Company of America until late 1944 (CDM, 1991). In 1948, the property was acquired by the Columbia Steel Company (CSC). In March 1952, the US Navy purchased the property from CSC and established DAC as the contractor and operator of the facility for the manufacturing of aircraft and aircraft parts. DAC purchased the property from the Navy in 1970 (CDM, 1991).

Most manufacturing operations at the Subject Property have been inactive for approximately four years. Most of the manufacturing equipment has been removed from the facility. The following sections briefly describe the structures and evident previous activities performed in each building on the Subject Property.

<u>Building 18</u>

Building 18 is a two-story wood frame office building located near the southwest corner of the Subject Property. According to DAC personnel, this building was always used as office space. Dry-type electrical transformers were observed in the basement. The building is no longer in use.

Building 20

Building 20 is located in the south central portion of the Subject Property. The building currently houses motor vehicle maintenance operations for the facility. A battery charging station is located at the north end of the building. South of the charging station is a steam cleaning booth. Cleaning fluids drain to a three-stage clarifier located in the center of the booth. The clarifier was observed through a floor grating to contain liquids with an oily sheen. An aboveground storage tank (AST) located at the southwest exterior of the cleaning booth contains unused motor oil. Several hydraulic lifts were observed in the maintenance shop south of the cleaning booth. According to DAC personnel, a pit containing standing liquids in the southwest corner of the building was a condensate collection sump, from which the liquids were periodically removed.

Two underground storage tanks (USTs) and a pump island are located on the east side of Building 20. The tank island has two pumps that dispense unleaded and regular gasoline.

Building 32

Building 32 was the C-6 facility cafeteria and meeting hall. Most of the kitchen equipment has been removed from the kitchen area. According to DAC personnel, this structure was built sometime in the 1980s. The previous building at this location housed the offices and indoor storage for a salvage yard located in the rear of the building.

Buildings 60, 60A, and 60B

Building 60 is a two-story building on the north side of Building 18. Building 60A is a wood frame observation tower west of Building 60. Building 60B is a similar observation tower east of Building 60. A pair of large radar or radio antennas are located on the second floor. According to DAC personnel, this was a radar or radio testing facility. Two small, non-numbered buildings to the east of Building 18 appear to be related to the radio or radar testing activities.

Groundwater Monitoring Well

One groundwater monitoring well located near the central western boundary of the Subject Property is part of a quarterly groundwater monitoring program implemented by DAC to evaluate chemical transport in shallow zone aquifers beneath the C-6 facility (Figure 2). The well, constructed with 4-inch diameter Schedule 40 PVC, has a total depth of approximately 90 feet bgs. The well is locked, capped with a flush-mounted Christy box, and labeled as a monitoring well.

3.2 Adjoining Properties

The Subject Property is bordered by the remainder of the C-6 facility on the north, south, and east, and by the International Light Metals (ILM) property to the west. The surrounding properties consist mainly of light industrial and manufacturing facilities and office buildings.

An aerial photograph from the Spence collection indicates that the surrounding properties were farmland as late as 1933. Sometime later during the 1930s, industrial development began to the southeast and south of the Subject Property. The records review indicates that the Montrose Chemical Plant produced pesticides in a facility located adjacent to the C-6 facility to the south. A large rubber production facility was located to the southeast across South Normandie Avenue. Photographs from 1941 and 1945 indicate the property to the west of the C-6 facility was first developed as a rubber plant during that time period. Subsequent photographs indicate that this facility underwent several additions and renovations up to the 1990s. A large manufacturing plant was developed to the east of South Normandie Avenue sometime between 1945 and 1956. Photographs from the

1960s to the present show that there was much development and industrial redevelopment of the areas surrounding the C-6 facility.

Present development to the north of 190th Street consists of office buildings. An office building located at the northeast corner of 190th Street and South Normandie was built in 1986. Properties to the east of the C-6 facility across South Normandie include a Texaco gas station, a cement plant, a bakery, an office building, and an auto repair shop.

C-6 facility operations to the north of the Subject Property consists of a parking area, a metal finishing building (Building 67) and a storage building (Building 57). C-6 facility operations to the east include the aircraft parts assembly in Building 1; operations to the south consist of offices and parking. Demolition activities are on-going at the ILM facility to the west. Nearly all aboveground structures have been removed from ILM's property.

3.3 Site and Regional Geology and Hydrogeology

The following sections describe the Subject Property and regional geology and hydrogeology.

<u>Subject Property and Regional Geology</u>

Kennedy/Jenks reviewed boring logs from the demolition plans of Building 67 dated 2 February 1968 and a Phase II subsurface soils investigation performed in 1991 (CDM, 1991). The reports show that the Subject Property is underlain by fine-to medium-grained sand, silty sand, and clayey sand. Borings from both investigations were advanced to a depth of approximately 30 feet below ground surface (bgs).

Regionally, the Subject Property is located in the Torrance Plain. Subsurface sediments in this region consists mainly of Recent alluvial deposits of gravel, sand, clay, and silt to a depth of approximately 175 feet bgs.

Subject Property and Regional Hydrogeology

According to Department of Water Resources (DWR, 1961), the Subject Property is located in the Torrance Plain and underlain by the Gage Aquifer, a water-bearing zone within the Lakewood Formation, from approximately 110 to 160 feet bgs. The Lakewood Formation extends to a depth of approximately 175 feet bgs. Beneath the Lakewood Formation is the San Pedro Formation, which extend to a depth of approximately 1,000 feet bgs. Water-bearing zones in this formation consists of the Lynwood Aquifer from approximately 300 to 390 feet bgs and the Silverado Aquifer from approximately 400 to 670 feet bgs (DWR, 1961). The Silverado Aquifer is considered a source of drinking water.

According to recent groundwater monitoring performed by Kennedy/Jenks for DAC (Kennedy/Jenks, 1996), local groundwater elevations range from approximately 15.5 feet to 16 feet below msl. Recent and historical data suggests that the groundwater flow direction is to the southeast.

Groundwater samples collected from the network of wells at the C-6 facility indicate that the shallow zone aquifer at approximately 60 to 90 feet bgs has been impacted by chlorinated and non-chlorinated volatile organic compounds (VOCs). Concentrations of trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE) ranged from 35 micrograms per liter (ug/L) to 20,000 ug/L in a recent sampling event (Kennedy/Jenks, 1996).

Chemical constituents detected in well DAC-P1, located on the Subject Property, included 1,1-DCE (120 ug/L), 1,1-dichloroethane (2 ug/L), 1,1,1-trichloroethane (TCA) (38 ug/L), TCE (20,000 ug/L), cis-1,2-DCE (130 ug/L), trans-1,2-DCE (5 ug/L), chloroform (45 ug/L), benzene (5 ug/L), toluene (680 ug/L), 1,1,2-TCA (4 ug/L), and perchloroethene (11 ug/L). Quarterly monitoring dating back to 1987 for well DAC-P1 does not show significant changes in TCE concentrations. Recent data for the remaining analytes have been consistent with historical monitoring data.

In a technical memorandum dated 5 July 1994, Kennedy/Jenks reviewed available environmental regulatory agency files to evaluate the potential for the onsite migration of VOCs from offsite sources. In the memorandum, Kennedy/Jenks identified three sites where subsurface releases of VOCs may have migrated onto the Subject Property. Industrial Molding Company (IMC), located at 2015 West 190th Street, is located approximately 3/4-mile west and upgradient of the C-6 facility. Previous operations at the IMC facility produced paint sludges, polymeric resin wastes, oil/water sludges and metal dust. Risto-Los Angeles, located at 1441 West 190th Street and north of the C-6 facility, manufactures industrial and refrigeration machinery and equipment. The California Department of Toxic Substance Control identified Risto as a site for preliminary environmental assessment. The potential impact of this location on the Subject Property is not known. ILM, located at 19200 South Western Avenue, is adjacent to the Subject Property to the west. Wastes generated at the ILM facility included spent acidic and caustic sludges, spent petroleum solvents, polychlorinated biphenyls (PCBs) and spent 1,1,1-TCA. Both petroleum solvents and chlorinated solvent were stored in USTs at the site.

4.0 ENVIRONMENTAL RECORDS REVIEW

The following section summarizes information obtained during the review of available regulatory agency database listings and facility records supplied by DAC.

4.1 Regulatory Agency Records Review

Kennedy/Jenks conducted a review of available environmental regulatory agency database listings for references to the Subject Property and to evaluate the presence of adjoining properties that may be of concern to the Subject Property. Kennedy/Jenks retained Vista Environmental Information, Inc. (Vista) to assist with the database listing search.

Vista performed a review of 17 pertinent environmental regulatory agency databases. The database search included 141 references within five-eighths of a mile of the Subject Property (including the Subject Property), 27 references within five-eighths to three-quarters of a mile, 22 references within three-quarters to one mile, and eight references within one to one and one-half miles. The C-6 facility appeared on seven of the databases searched:

- A reference to DAC exists in an EPA database list of large quantity generators who generate at least 1000 kilograms per month of hazardous waste.

- The C-6 complex appears on both a state and regional database listing of sites with leaking USTs. Both references indicate that groundwater was impacted by solvents.

- There are three references to the C-6 facility on the state database list of facilities with USTs. The three references indicate an inconsistent number of USTs at the C-6 facility.

- The C-6 facility appears on the CERCLIS list, an EPA-maintained database list of sites either proposed or current National Priorities List (NPL) and sites which are or were in the screening and assessment phase for possible inclusion on the NPL. CERCLIS sites designated as "No Further Remedial Action Planned (NFRAP)" may be sites where an initial investigation found that there were no environmental impacts, environmental impacts were removed quickly without need for the site to be placed on the NPL, or the environmental impact was not serious enough to require NPL consideration. The database reference indicates that the C-6 facility is currently an NFRAP site.

- Four references were recorded on the Emergency Response Notification System (ERNS) database. The ERNS database is a collection of reported releases of oil or hazardous substances made to federal authorities including the EPA, the US Coast Guard, the National Response Center, and the Department of Transportation. Two of the references are linked to a release of an unknown amount of nitrogen dioxide gas on 15 December 1993. The third reference is related to a spill of an unknown amount of a petroleum hydrocarbon. The fourth reference is related to a spill of hydrofluoric acid. In all of the cases, the agency to which the release was reported was not included in the database information.

Several properties adjacent to the C-6 facility appeared in the database listings.

- Lawson Enterprises, Inc., located at 19500 South Normandie Avenue, is on the database list of proposed, current, or deleted NPL sites. The database listing indicates that no further remedial action was planned as of 1 June 1986. Jay Steinbeck is noted on the state-maintained list of USTs at the same address as Lawson Enterprises. This site is located east of the Subject Property across South Normandie Avenue.

- Pacific Gateway at 19525 South Normandie is referenced on a database list of small quantity hazardous waste generators. This site is located east of the Subject Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- Alpine Foreign Car Service at 19530 South Normandie Avenue is referenced on the database list of large quantity generators. This site is located east of the Subject Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- The Del Amo Facility, a 3.7 acre area located about one-quarter mile to the southeast of the Subject Property, appears on the EPA's National Priority List, California Department of Toxic Substances Control's State Priority List, and on the CERCLIS list. The database listing indicates that EPA has taken regulatory responsibility for the site and that remedial investigations are currently under way. The Del Amo facility was used as a waste disposal area for local rubber manufacturers from 1942 to 1969. Sampling of groundwater at the Del Amo site has indicated the presence of polynuclear aromatic hydrocarbons and VOCs in the groundwater (Kennedy/Jenks, July 1994). The VISTA map illustrates both the area of the site and offsite areas being screened as part of the site assessment.

- The site at 1225 West 196th Street is referenced six times in the databases reviewed. This site borders South Normandie Avenue to the west and is southeast of the Subject Property. American Polystyrene appears on the database list of large quantity hazardous waste generators and on a database registry of users of hazardous chemicals known as the Toxic Release Inventory System (TRIS). The TRIS reference indicates that chemicals used at the site include styrene and ethylbenzene. Amoco Chemicals at the same address appears on the EPA CERCLIS list, the state CERCLIS list, and on the CORTESE list, a state-maintained list of sites with hazardous materials releases. Amoco is also on the ERNS list for a 5,000 pound release of styrene gas on 7 September 1990.

- Greene's Ready Mix Concrete at 19030 South Normandie Avenue appears on a state-maintained list of UST owners and on a state-maintained list of leaking UST owners. The leaking UST reference indicates that the release was cleaned up and that the case has been closed. This site is located to the east of the Subject Property across South Normandie Avenue.

- A Texaco station located at 19008 South Normandie appears on the state-maintained list of UST owners. The gas station is located east of the Subject Property on the southeast corner of West 190th Street and South Normandie Avenue.

- South Bay Corp. at 1411 West 190th Street appears on the state-maintained list of leaking UST owners, a regional list of leaking UST owners, and on the CORTESE list.

The database references indicate that a UST containing diesel has released an unknown quantity of fuel. The references also indicate that no remedial actions have been taken by the responsible party. This site is north of the Subject Property across West 190th Street.

- The facility adjacent to the Subject Property to the west, located at 19200 South Western Avenue, appears on seven databases. The site appears twice on the CORRACTS list, a list of facilities which have received a corrective action order from the EPA due to a release of hazardous materials or wastes into the environment. The CORRACTS reference for a Northrop Corporation at this site indicates that no further action is necessary. The CORRACTS reference for a Martin Marietta facility at this location indicates that further corrective action is necessary, but that the site has a low prioritization status. The site also appears on the CERCLIS list and the state-equivalent CERCLIS list. The database listing on the CERCLIS list indicates that the site is undergoing preliminary assessment activities; the database listing for the state listing indicates that no further action is required at the site. The site appears again on the CERCLIS list as Martin Marietta Aluminum. This reference indicates that the site is still in discovery status. The site appears on the state lists of aboveground storage tanks (ASTs) and USTs; no further information about the site is available from these reference listings. Six references in the ERNS database shows that the following releases of hazardous materials occurred:

    An unknown amount of waste oil and lubricants were spilled on the site on 1 February 1990.

    400 gallons of oily water were spilled on 3 August 1990. This incident has two listings in the ERNS database.

    900 gallons of chromic anhydride were discharged to the sewer system on 25 October 1991.

100 gallons of oil were spilled on 29 May 1990. (This incident has two listings in the ERNS database.)

- The Montrose Chemical facility located approximately three-eighths of a mile to the south of the Subject Property and directly adjacent to the C-6 facility appears on five databases. The site is listed on the NPL, SPL, and CERCLIS list. The site is currently on the NPL due to releases of DDT to groundwater.

4.2 DAC Documents

Kennedy/Jenks reviewed environmental documents for operations at the C-6 complex supplied by the DAC Environmental Services. These documents included UST removal reports, remediation reports, site assessment reports, historical drawings, an AST inventory list, and a technical memorandum. The following summarize the findings of the document review process that pertain to the Subject Property.

UST Removal and Soil Remediation Reports

Kennedy/Jenks reviewed several UST removal reports for USTs removed from the C-6 complex. The reports detailed tank removal activities of 7 USTs from the east side of Building 20. The reports indicated that some soils surrounding the tanks had been impacted by petroleum hydrocarbons, but confirmation sampling following further excavation indicated that all impacted soils had been removed.

UST Integrity Testing Reports

Kennedy/Jenks reviewed recent UST integrity testing reports. Two USTs are in service on the east side of Building 20. DAC records indicate that one steel-walled tank containing gasoline has been tested and passed annually. One two-compartment double-walled fiberglass tank has been tested every five years since being installed in 1988. This tank passed its last test in 1993. The DAC records show that the USTs on the Subject Property are in compliance with state regulations governing UST integrity testing.

Site Assessment Reports

Kennedy/Jenks reviewed separate Phase I and Phase II site assessments performed by CDM for DAC in 1991. A Phase I was performed for two parcels at the C-6 complex: the northern parking lot that is part of the Subject Property and the tool storage yard located to the southwest of the C-6 complex. CDM concluded that neither of the parcels appeared to have been used for the generation or storage of hazardous wastes or substances. Based on groundwater monitoring results that showed elevated concentrations of TCE , CDM recommended sampling along the western fence of the parking lot to investigate the possibility that activities at the adjacent facility to the west had impacted the subsurface beneath the Subject Property.

For the Phase II assessment, CDM advanced three soil borings in the parking lot to a total depth of 31.5 feet bgs. The soil samples were analyzed for VOCs, priority pollutant metals, PCBs, and organochlorine pesticides. Based on the analytical results that showed all analytes at concentrations below regulatory limits, CDM concluded that further investigation of the parking lot subsurface was not necessary.

Kennedy/Jenks reviewed field notes and laboratory analytical reports for soil samples collected from beneath the concrete pad that was used as a hazardous waste accumulation area between Building 29 and Building 1. The field notes state that soils were collected from three locations from approximately one foot beneath the concrete. The individual samples were combined, and a composite sample from the mixture was sent to an analytical laboratory for analysis of total chromium, hexavalent chromium, lead, zinc, and total cyanides, and VOCs by EPA Method 8020. Metals concentrations were within expected natural ranges. Chemical constituents detected in the sample included cyanide (0.053 mg/Kg), 1,2-dichloroethane (0.05 mg/Kg), 1,1,1-TCA (17 mg/Kg), 1,1,1,2-tetrachloroethane (0.21 mg/Kg), and toluene (0.03 mg/Kg).

Historical Drawings

Historical drawings provided by DAC included an Aluminum Company of America (ALCOA) drawing dated 25 February 1942 entitled "Bldg. #68 - 5000 bbl. Fuel Oil Tanks and Pump House Foundations - Plan and Details, another ALCOA drawing dated 3 May 1943 entitled "D.P.C. - Fuel Storage Tanks - Their Location", a DAC drawing originally dated 3 September 1963 entitled "Master Shore Station Development Plan", and as-built drawings and demolition plans for the additions performed on the Subject Property dated May 1968.

The 1945 drawing shows the location of USTs at the entire facility. No USTs were present on the Subject Property at that time.

AST Inventory List

DAC provided Kennedy/Jenks with an inventory of ASTs at the C-6 complex that was compiled in 1989. The list detailed tank sizes, locations, and contents. No tanks of environmental interest or related to processes of environmental interest on the Subject Property were noted on the list.

Technical Memorandum

A technical memorandum written by Kennedy/Jenks and dated 5 July 1994 summarizes the result of an assessment for the potential onsite migration of VOCs from offsite areas and assessed the value of installing offsite monitoring wells to evaluate groundwater conditions upgradient from the C-6 complex. The report identified three sites with a potential to impact groundwater quality beneath the Subject Property and concluded that further offsite subsurface investigation would not aid in the identification or remediation of impacted groundwater beneath the C-6 facility.

The three sites identified were:

- the former ILM facility adjacent to the Subject Property to the west;
- the Industrial Molding Corporation facility located approximately 3/4-mile west of the Subject Property; and
- the Risto-Los Angeles facility located to the north of the Subject Property across West 190th Street.

The report suggested that an offsite source or sources have significantly contributed to high concentrations of solvents detected in a groundwater monitoring well located on the Subject Property within the C-6 complex.

4.3 Sanborn Fire Maps

Kennedy/Jenks retained Vista to perform a Sanborn Map-Site Search for the Subject Property. Sanborn certifies that no Sanborn Maps are available for the Subject Property.

5.0 SITE WALK-THROUGH OBSERVATIONS AND INTERVIEWS

The following sections summarize observations and areas of potential environmental interest noted during the site walk-throughs and during interviews with DAC personnel.

5.1 Hazardous Substance and Waste Handling

Though the C-6 complex has not stopped operations altogether, few operations are ongoing in the section of the complex occupied by the Subject Property. Storage of hazardous wastes or materials were noted in one area of Building 29. DAC personnel indicated that large quantities of hazardous materials were previously stored in a chemical storage area in Building 36, located east of the Subject Property on the opposite side of Building 1.

In general, concrete floors throughout the Subject Property appeared in good condition. No concerns were noted in areas that seemed likely to have been material storage areas.

5.2 USTs, Sumps, and Clarifiers

One unleaded gasoline UST and one regular gasoline UST are still in operation on the Subject Property. One clarifier with the covers welded shut was observed in a painting area in Building 29. One clarifier was observed in a steam cleaning area of Building 20.

5.3 ASTs

An oil storage AST was observed in Building 20 in a vehicle maintenance area. The floors surrounding the tank appeared clean.

5.4 Asbestos-Containing Materials

A survey for potential asbestos-containing materials was not performed as a part of this PESA. According to MDRC personnel, an asbestos survey has already been performed on the Subject Property. However, asbestos was commonly used in building materials prior to 1977. Based on the age of the facility, it is likely that asbestos-containing materials are present on the Subject Property.

5.5 PCBs

Fluorescent light ballasts and electrical transformers manufactured prior to 1977 may contain oils with PCB concentrations requiring special management. Electrical transformers may also contain oils with PCB concentrations requiring special management.

Fluorescent light ballasts that appeared to be manufactured prior to 1977 were observed throughout the Subject Property.

All electrical transformers at the C-6 facility have been tested and labeled for the presence (or non-presence) of PCBs. None of the transformer stations on the Subject Property were labeled as containing PCBs.

5.6 Lead-Based Paint

Based on the age of the biuldings on the Subject Property, lead-based paints are likely present.

6.0 CONCLUSIONS

Several areas of environmental interest were identified during the PESA. These areas relate to past manufacturing processes, hazardous materials usage areas, clarifiers, areas identified on facility drawings, and impact from adjacent properties.

At the following areas on the Subject Property, there is a possibility that any release of a hazardous substance could have impacted surrounding soils:

- A three-stage clarifier in Building 20 that receives wash water from a steam cleaning booth;

- Hydraulic lifts in Building 20;

The Subject Property is within one-quarter mile of two EPA Superfund sites. These sites are not expected to have had an environmental impact on the Subject Property.

Quarterly sampling and analysis of groundwater collected from a monitoring well located near the western boundary suggests that solvents detected in the groundwater beneath the subject property may have originated at an offsite source.

7.0 REFERENCES

Aerial Map Industries Aerial Photo Collection, Aerial Map Industries, Irvine, California.

California Department of Water Resources, Bulletin No. 104 - Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County, June 1961.

Camp, Dresser & McKee Inc., Phase I Environmental Assessment of the Douglas Aircraft C-6 Facility, Parking Lot and Tool Storage Yard, 13 June 1991.

Camp, Dresses & McKee Inc., Phase II Environmental Assessment of the Douglas Aircraft C-6 Facility, Parking Lot and Tool Storage Yard, 21 August 1991.

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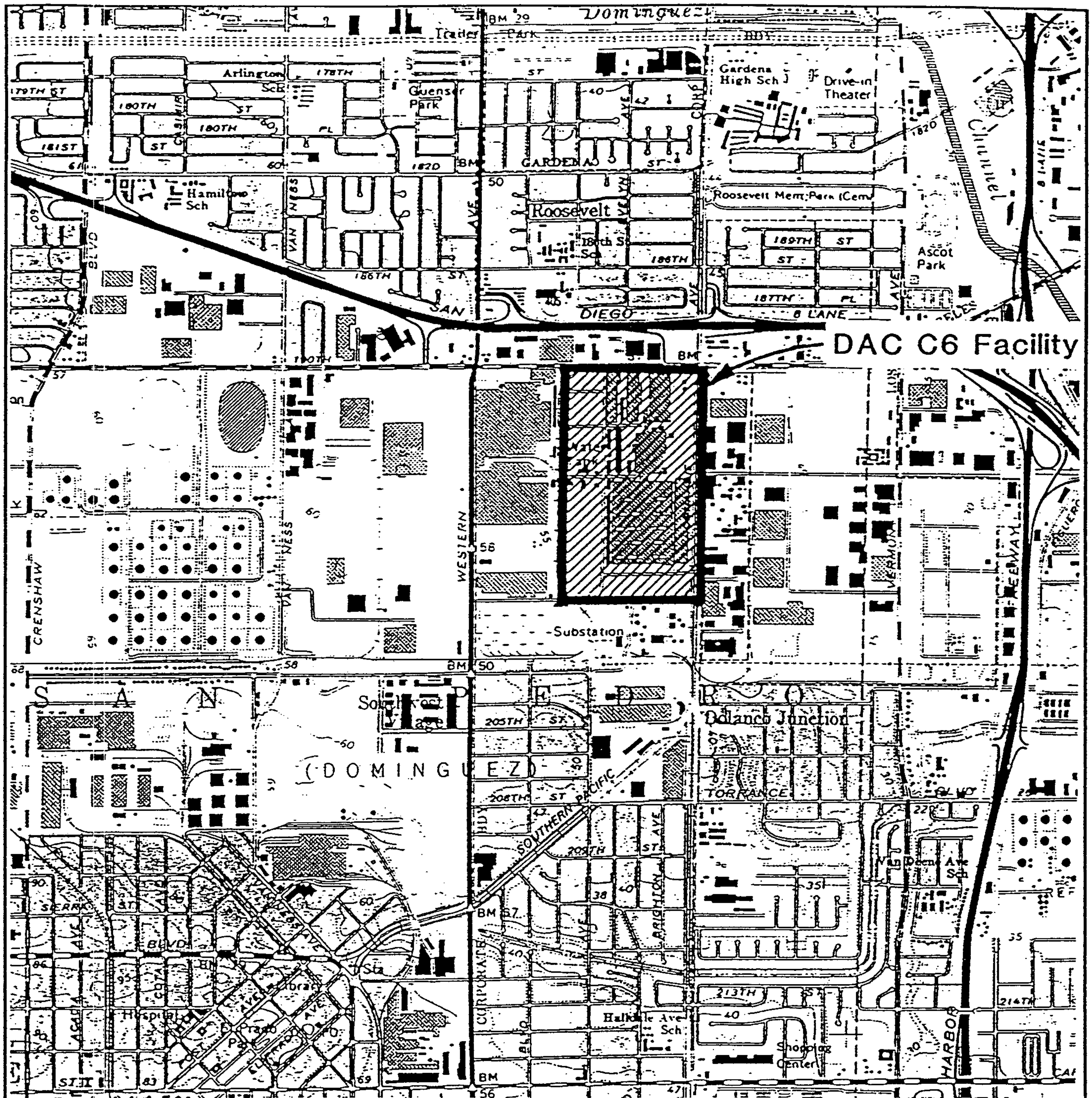
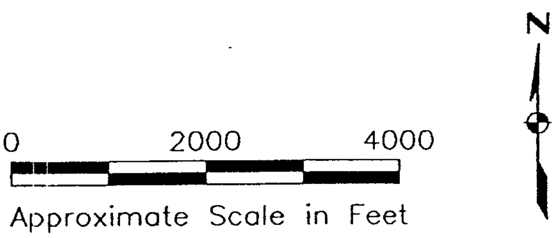
Historical C-6 Facility Drawings, provided by Douglas Aircraft Company Environmental Engineering Services, Long Beach, California.

Kennedy/Jenks Consultants, Technical Memorandum to Dan Summers, MDC Law, 5 July 1994.

Kennedy/Jenks Consultants, Groundwater Monitoring Data Summary Report, Fourth Quarter 1995, January 1996.

Spence Aerial Photograph Collection, Department of Geology, University of California, Los Angeles.





Base Map: U.S.G.S. 7.5 Minute Topographic Map, Torrance, California Quadrangle, 1981.

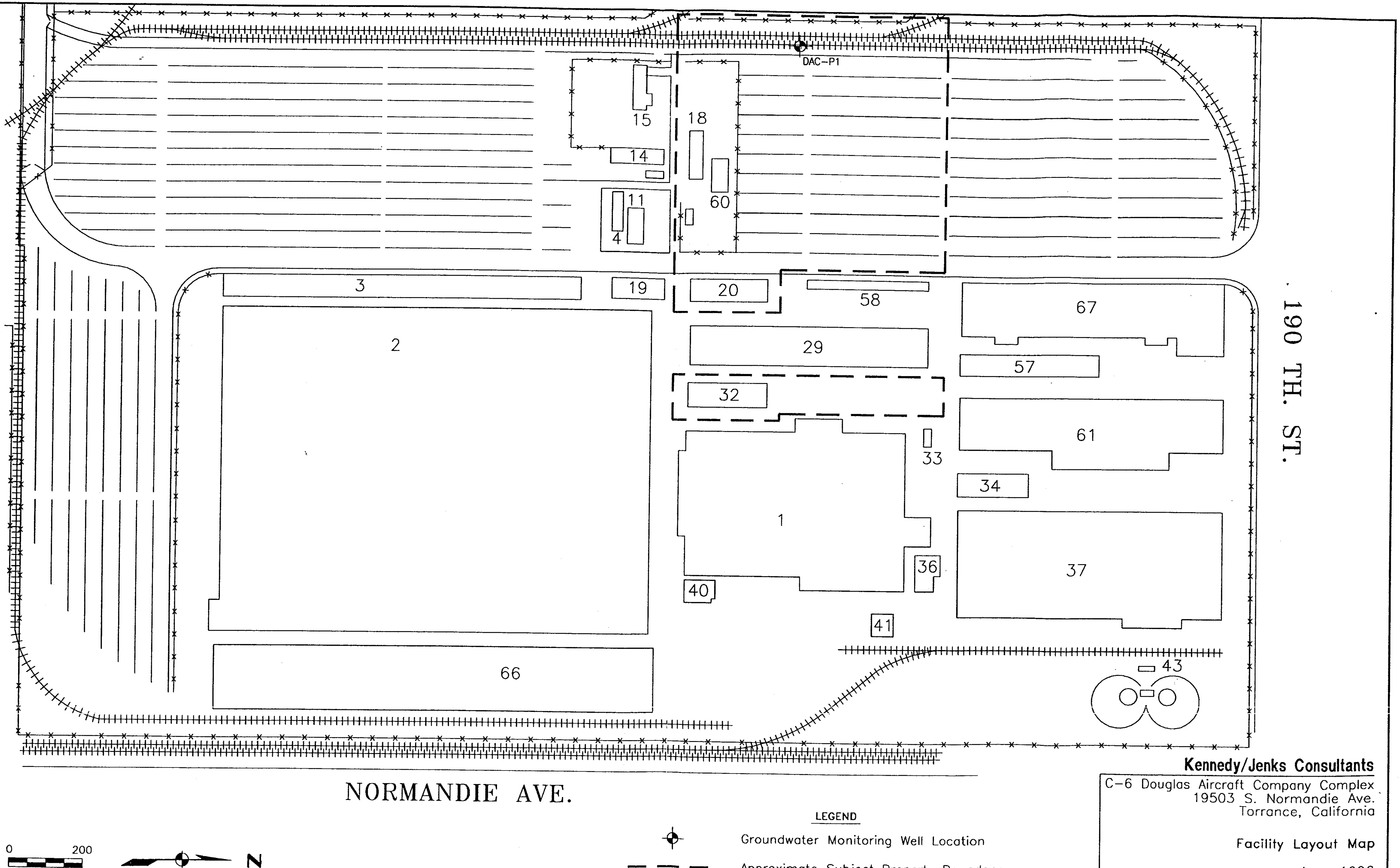
Kennedy/Jenks Consultants

C–6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Site Vicinity Map

June 1996
K/J 954019.00

Figure 1



LEGEND

Groundwater Monitoring Well Location

Approximate Subject Property Boundary

Kennedy/Jenks Consultants

C-6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Facility Layout Map

June 1996
K/J 954019.00

Figure 2

SUMMARY PHASE I ENVIRONMENTAL
ASSESSMENT
DOUGLAS AIRCRAFT C-6 FACILITY
PARCEL C

MCDONNELL DOUGLAS REALTY COMPANY

JUNE 1996

K/J 954019.00

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LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

McDonnell Douglas Realty Company (MDRC) retained Kennedy/Jenks Consultants to perform a Phase I Environmental Site Assessment (PESA) on a parcel (Subject Property) of the Douglas Aircraft Company (DAC) C-6 Facility in Torrance, California. The parcel, Parcel C, is located in the southern half of the facility and is bounded by the remainder of the C-6 facility to the north, the Industrial Light Metals facility to the west, South Normandie Avenue to the east, and the former Montrose Chemical site and a DAC storage yard to the south. Facility structures included in the Subject Property were Buildings 1, 2, 3, 4, 11, 13, 14, 15, 19, 40, 41, 45, and 66, the southern portion of the west employee parking lot and the south employee parking lot. The area surrounding the C-6 facility consists mainly of light industrial and manufacturing facilities.

The C-6 facility is topographically flat, with an elevation of approximately 50 feet above mean sea level. The facility is located within the Torrance Plain and underlain by the Lakewood Formation which consists mainly of gravel, sand, clay, and silt. Water bearing zones beneath the parcel include the Lynwood Aquifer and the Gage Aquifer. The groundwater gradient is generally to the southeast. Recent groundwater elevation measurements indicate that the depth to groundwater is approximately 65 feet below ground surface.

Prior to 1941, the Subject Property was undeveloped farmland. In 1941, the Subject Property was developed by a US government agency as an aluminum plant. DAC occupied the facility in the 1950s and eventually purchased the property in 1970.

Historical manufacturing activities on the Subject Property have included aluminum forging operations, warehousing, and aircraft parts manufacturing. Hazardous materials have historically been used and stored on the site. Previous long-term handling and storage practices of hazardous materials and wastes are difficult to assess due to the age of the facility.

Kennedy/Jenks reviewed environmental records provided by DAC and performed a search of regulatory agency databases to identify properties in the vicinity that may impact the Subject Property. Underground storage tank (UST) records indicate that at least 28 USTs have been previously located on the Subject Property. None of the 28 remain in service today. The records review revealed that groundwater beneath the Subject Property has been impacted by volatile organic compounds (VOCs). Results from a Phase II investigation in the western parking lot suggests that VOCs may be migrating onsite in shallow zone aquifers beneath the Subject Property from offsite sources.

2.0 INTRODUCTION

This report summarizes the results of a PESA of a parcel of the DAC C-6 complex located at 19503 South Normandie Avenue in Torrance, California. The PESA was conducted by Kennedy/Jenks Consultants (Kennedy/Jenks) on behalf of McDonnell Douglas Realty Company (MDRC). The location of the C-6 complex is presented in Figure 1. A layout of the C-6 facility, including the area of the complex evaluated for the PESA is presented in Figure 2. The findings of the PESA are based on site walk-throughs performed by Mr. Rick Pastore of Kennedy/Jenks during March and April 1996. Supplemental information was obtained from interviews with DAC facilities personnel, from facility regulatory and environmental compliance documents provided by DAC Environmental Services, from a review of available regulatory agency files, and from a review of historical aerial photo collections. This summary Phase I document has been produced at the request of DAC, and does not include supporting data appended to the original report, "Phase I Environmental Assessment, Douglas Aircraft C-6 Facility, Parcel C" submitted in May 1996.

2.1 Purpose

MDRC is considering development of Parcel C, the southern section of the DAC C-6 complex. MDRC retained Kennedy/Jenks to conduct a PESA regarding past and present operations in this section of the facility (Figure 2).

2.2 Scope of Services

Kennedy/Jenks performed the following Scope of Services in conjunction with this PESA:

- Reviewed the history of the Subject Property. Historical information was obtained from a review of historical facility drawings, interviews with DAC personnel, and a review of aerial photographs available from the Aerial Map Industries, Inc. collection in Irvine, California and the Spence collection and Fairchild collection at the University of California, Los Angeles.

- Reviewed available public records regarding previous environmental investigations and remediation activities at the Subject Property, inspection records, and groundwater monitoring reports obtained from DAC Environmental Services; and regulatory agency databases pertaining to site environmental compliance interests at the Subject Property.

- Performed a site walk-through of the Subject Property to observe current recognizable environmental conditions. The site walk-through focused on chemical handling, presence of storage tanks, hazardous substance and waste handling, and potential releases of hazardous materials on the Subject Property. In addition, Kennedy/Jenks performed a reconnaissance of the adjoining properties to identify potential impacts to the Subject Property.

2.3 Limitations and Exceptions of Assessment

The PESA is based on visual observations of existing site conditions, interviews of personnel familiar with the facility, and a review of relevant compliance documents and regulatory agency files. No environmental sampling or laboratory analyses were performed in conjunction with the PESA. The findings do not constitute a warranty, guarantee, or positive assertion as to the presence, absence, or extent of hazardous materials at the Subject Property. This PESA was prepared by Kennedy/Jenks for sole beneficiary use by MDRC and is not intended to be relied on by others.

This PESA report represents Kennedy/Jenks' professional opinions and judgments, which are dependent upon information obtained during performance of consulting services. Environmental conditions may exist at the Subject Property which cannot be identified by visual observations only. The accuracy of information and data supplied by others has not been independently verified by Kennedy/Jenks during the performance of this PESA.

2.4 Methodology

This PESA has been prepared in accordance with standards set forth in ASTM Standard E-1527-93. These standards have been developed by ASTM to establish general site assessment practices that satisfy due diligence responsibilities of participants in real estate transactions.

3.0 SUBJECT PROPERTY DESCRIPTION

The following sections describe the Subject Property history and the geographic setting of the Subject Property. Subject Property history was compiled from DAC historical facility drawings, DAC environmental reports, interviews with DAC employees, and a review of available aerial photographs.

3.1 Subject Property Description and History

The Subject Property is a portion of the DAC C-6 manufacturing complex located at 19503 South Normandie Avenue in Torrance, California (Figure 2). The topography of the facility is essentially flat with an elevation of approximately 50 feet above mean sea level (msl). The areas of the facility studied for this report include Buildings 1, 2, 3, 4, 11, 13, 14, 15, 19, 40, 41, 45, and 66, the southern portion of the west employee parking lot and the south employee parking lot. Operations at the Subject Property include aircraft parts assembly and warehousing.

Aerial photos indicate that the Subject Property was farmland prior to the 1940s. The Subject Property was first developed by the Defense Plant Corporation in 1941 as part of an aluminum reduction plant. The plant was operated by the Aluminum Company of America until late 1944 (CDM, 1991). In 1948, the property was acquired by the Columbia Steel Company (CSC). In March 1952, the US Navy purchased the property from CSC and established DAC as the contractor and operator of the facility for the manufacturing of aircraft and aircraft parts. DAC purchased the property from the Navy in 1970 (CDM, 1991).

Most manufacturing operations at the Subject Property have been inactive for approximately four years. Most of the manufacturing equipment has been removed from the facility. A limited amount of assembly and activities related to warehousing currently continue.

The following sections briefly describe the structures and evident previous activities performed in each building on the Subject Property.

Building 1

Building 1 is an approximately 250,000 square foot building currently used as a parts and records storage warehouse. The building was originally used as a carbon baking area when the facility was an aluminum production plant. More recent activities have included metal finishing processes such as heat treating, milling, and pressing. Most equipment has been removed.

Historical drawings from the 1940s up to 1984 and aerial photographs indicate that Building 1 was originally three individual buildings with two enclosed patio areas between the three buildings. The drawings show that one patio area was an emissions scrubber and water treatment area. According to a 1952 demolition drawing, other structures removed from the patio areas included a smoke stack, a pump house, and six underground fuel storage tanks.

A one-level basement underlies portions of the structure. The basement was not part of the original construction of the three buildings; it may have been added in the 1952 renovation of the building. The basement is currently used for the storage of dies and molds. DAC personnel stated that the east wing of the basement was once used as a painting area. There are three freight elevators and three stairways providing access to the basement.

Floor patches on the first level and in the southwest corner of the Building 1 indicate the former location of several drop hammer pits. According to DAC personnel, these pits were approximately 10 feet deep. The pits have been filled with concrete with the exception of one pit which is covered with steel plates.

A mezzanine level in an annex at the north end of the building houses several transformers that are labeled as containing polychlorinated biphenyls (PCBs). This area is outside the boundaries of the Subject Property.

Building 2

Building 2 is an approximately 1,000,000 square foot structure currently used as a parts assembly and parts storage warehouse. Aerial photographs show that activities in the building included aluminum reduction operations at the time of its construction. More recent activities have included aircraft parts manufacturing and assembly.

The building is divided into six east-west wings that are separated from each other by outdoor patio areas. The patio areas are not continuous across the length of the structure; there are four separate patio areas between each east-west wing. Uses of each of the patios vary. Some of the patio areas have been improved with the construction of two-story office structures. Other patio areas were used as recreation areas or work areas. Four mezzanine levels, also used for storage, are located at various locations in the building.

Continuous aisleways traverse the north-south length of the structure through the center, on the west side, and on the east side. The center aisleway is continuous northward out of the Building 2, through an enclosed area between Building 1 and 2, and through Building 1.

Two enclosed areas between Buildings 1 and 2 housed metal treating activities when the facility was in operation. The western enclosed area, approximately 4,300 square feet, was a metal cleaning and anodizing area. The eastern enclosed area, approximately 6,700 square feet, housed chemical milling operations. Equipment from the former chemical milling operations is still in place.

Concrete containment pads on the east side of the building are the former locations of a chrome recovery system, a coolant recovery system, and an oil filtration system. All of the equipment from these operations has been removed.

An enclosed area on the east side of Building 2 and on the south side of Building 41 housed chemical milling operations. Some of the equipment from this operation, such as large process tanks within secondary containment areas, remains in place. Some of the tanks are coated with a white precipitate.

Building 3

Building 3 is an approximately 168,000 square foot, three-story brick office building that housed DAC administrative offices when the facility was in operation. Most of the offices are currently vacant.

The structure was originally a rectifier building when the facility was an aluminum production plant. Aerial photographs from the 1940s show a large number of electrical transformers on the west side of the building and another structure that appears to be a maintenance building to the west of the transformer bank. The layout of the rectifier building is not known. DAC facility drawings show that the building was renovated into its present layout in 1952.

Building 4

Building 4 is an approximately 3,000 square foot structure which houses electrical equipment. A room in the eastern portion of the building is used for battery charging. All electrical power for the C-6 facility enters through control boxes in this building. The construction date of this building is not known.

Building 11

Building 11 is an approximately 20,000 square foot, five story building that formerly housed maintenance operations. The building is currently used for storage of maintenance equipment, office equipment, and records.

Building 13

Building 13 is an approximately 800 square foot brick storage shed. Recent uses have included the storage of compressed gas cylinders. Historical uses are unknown.

Building 14

Building 14 is an approximately 7,500 square foot building that housed the company store. The structure was part of the original construction of the Subject Property. The building is currently used for records storage.

Building 15

Building 15 is an approximately 6,200 square foot brick building that housed the payroll department and a photo lab. It is presently used as a shipping office.

Building 19

Building 19 is an approximately 7,500 square foot brick building that houses the security office and emergency services for the facility. The building also served this function during manufacturing operations.

Building 40

Building 40 is an approximately 4,200 square foot brick structure. Drums of lubricant and hydraulic oil are presently stored in the building. It was formerly used as a chemical storage area.

Building 41

Building 41 is an approximately 4,700 square foot building that was formerly the boiler house. Three of the boilers have been removed, while one remains in place but not in operation. Operating equipment in this building consists of two air compressors.

Building 45

Building 45 is currently the hazardous waste accumulation area for the facility. Hazardous waste disposal is contracted by DAC to an outside vendor who is responsible for the maintenance of this area. This area was constructed between 1986 and 1989.

Building 66

Building 66 is an approximately 200,000 square foot warehouse that was constructed in 1972. Prior to its construction, this area of the facility was a storage yard. Other activities in the building include the assembly of shipping supplies and light tool cutting.

Building 66-1 is an approximately 6,300 square foot wood-frame shipping office north of Building 66. An oil-stained concrete slab area to the west of Building 66-1 is a cleaning area. The cleaning area drains to a sludge tank to the north.

Tool Storage Yard

The tool storage yard is a roughly rectangular area of about 1.1 million square feet in the southwestern portion of the Subject Property. The yard is bounded by railroad tracks to the east and south, Western Avenue to the west, and the Capitol Metals facility to the north. The area is used to store a vast quantity of master tools used to make aircraft parts. Most of the tools are stored in wooden crates in a wide variety of sizes. Nine railroad spurs divide most of the tool yard into north-south trending strips, and are flanked on both sides by tools. Three small buildings (numbers 54, 55, and 56) located near the gate to the yard are used for office space and storage of forklifts, service vehicles, and tools. A transformer is located adjacent to building 54. No staining or signs of spillage were observed on the ground around the transformer.

Scrap Material Storage Area

The scrap metal storage area, also known as the bone yard, jig yard, or triangle area, occupies the southernmost portion of the Subject Property. The area comprises about 100,000 square feet in a long, narrow strip bounded by a transformer substation to the east, residential development to the south, railroad tracks to the north, and Western Avenue to the west. Unused miscellaneous equipment and material stored in the area included a chromic acid dip tank and wire mesh dip tank baskets, trash compactor, cyclone vents, refrigerators, a large quantity of steel beams and pipes, cement parking pylons, pumps, sheet metal, cinder blocks, tires, and railroad rails. Also stored in the area was a waste oil pump attached to a small temporary holding tank, and two small roll-off bins. Labeling indicates the bins were used to collect and transport the waste oil to a disposal facility.

Groundwater Monitoring Wells

Eleven groundwater monitoring wells located throughout the Subject Property are part of a quarterly groundwater monitoring program implemented by DAC to evaluate the chemical characteristics of shallow zone aquifers beneath the C-6 facility (Figure 3). An additional four wells located on the C-6 facility are part of the quarterly monitoring program but are not located on the portion of the facility included in the Subject Property.

Eight of the groundwater monitoring wells, constructed with 4-inch diameter Schedule 40 PVC, have a total depth of approximately 90 feet bgs. Two of the wells, similarly constructed, have a total depth of approximately 120 feet. One well is constructed with 2-inch diameter PVC with a total depth of approximately 90 feet. All of the wells are locked, capped with a flush-mounted Christy box, and labeled as monitoring wells.

Four groundwater monitoring wells located near the south end of the Subject Property were installed to investigate possible chemical transport in the shallow zone related to earlier pesticide production activities at the adjoining property, the former Montrose Chemical Plant site, to the south. The wells are constructed with 4-inch diameter casing and have dedicated pumps. The wells were installed in 1990 as a part of the Montrose Site Remedial Investigation conducted under the direction of the EPA.

3.2 Adjoining Properties

The Subject Property is bordered by the remainder of the C-6 facility on the north, by the International Light Metals (ILM) property to the west, by the former Montrose Chemical site and a DAC storage yard to the south, and by South Normandie Avenue to the east. The surrounding properties consist mainly of light industrial and manufacturing facilities and office buildings.

An aerial photograph from the Spence collection indicates that the surrounding properties were farmland as late as 1933. Sometime during the 1930s, industrial development began to the southeast and south of the Subject Property. The records review indicates that the Montrose Chemical Plant produced pesticides in a facility located adjacent to the C-6 facility to the south. A large rubber production facility was located to the southeast across South Normandie Avenue. Photographs from 1941 and 1945 indicate the property to the west of the C-6 facility was first developed as a rubber plant during that time period. Subsequent photographs indicate that this facility underwent several additions and renovations up to the 1990s. A large manufacturing plant was developed to the east of South Normandie Avenue sometime between 1945 and 1956. Photographs from the 1960s to the present show that there was much development and industrial redevelopment of the areas surrounding the C-6 facility.

Present development to the north of 190th Street consists of office buildings. An office building located at the northeast corner of 190th Street and South Normandie was built in 1986. Properties to the east of the C-6 facility across South Normandie include a Texaco gas station, a cement plant, a bakery, an office building, and an auto repair shop.

The vacant property to the south of the Subject Property is the former location of the Montrose Chemical Plant. The plant has been demolished and the property has been capped with asphalt. Demolition activities are on-going at the ILM facility to the west. Nearly all aboveground structures have been removed from ILM's property.

C-6 facility operations to the north of the Subject Property included chemical storage in Building 36, parts machining in Buildings 37 and 29, a cafeteria in Building 32, and a transportation maintenance shop in Building 20. Buildings 29, 34, 37, 57, 61, and 67 are scheduled for demolition in 1996.

3.3 Site and Regional Geology and Hydrogeology

The following sections describe the Subject Property and regional geology and hydrogeology.

Subject Property and Regional Geology

Kennedy/Jenks reviewed boring logs from the demolition plans of Building 67 dated 2 February 1968 and a Phase II subsurface soils investigation performed in 1991 (CDM, 1991). The reports show that the Subject Property is underlain by fine-to medium-grained sand, silty sand, and clayey sand. Borings from both investigations were advanced to a depth of approximately 30 feet below ground surface (bgs).

Regionally, the Subject Property is located in the Torrance Plain. Subsurface sediments in this region consists mainly of Recent alluvial deposits of gravel, sand, clay, and silt to a depth of approximately 175 feet bgs.

Subject Property and Regional Hydrogeology

According to Department of Water Resources (DWR, 1961), the Subject Property is located in the Torrance Plain and underlain by the Gage Aquifer, a water-bearing zone within the Lakewood Formation, from approximately 110 to 160 feet bgs. The Lakewood Formation extends to a depth of approximately 175 feet bgs. Beneath the Lakewood Formation is the San Pedro Formation, which extend to a depth of approximately 1,000 feet bgs. Water-bearing zones in this formation consist of the Lynwood Aquifer from approximately 300 to 390 feet bgs and the Silverado Aquifer from approximately 400 to 670 feet bgs (DWR, 1961). The Silverado Aquifer is considered a source of drinking water.

According to recent groundwater monitoring performed by Kennedy/Jenks for DAC (Kennedy/Jenks, 1996), local groundwater elevations range from approximately 15.5 feet to 16 feet below msl. Recent and historical data suggests that the groundwater flow direction is to the southeast.

Groundwater samples collected from the network of wells at the C-6 facility (Figure 3) indicate that the shallow zone aquifer at approximately 60 to 90 feet bgs has been impacted by chlorinated and non-chlorinated volatile organic compounds (VOCs), particularly in the area of well WCC-6S near the central western exterior of Building 1 and well WCC-3S near the northeast corner of Building 1.

Maximum chemical constituent concentrations detected in the most recent sampling event included 1,1 - dichloroethene (1,1-DCE) (11,000 micrograms per liter (μg/L)), 1,1-dichloroethane (1,1 - DCA) (350 μg/L), 1,1,1-trichloroethane (1,1,1 - TCA) (3,100 μg/L), tricholorethene (TCE) (2,600 μg/L), cis-1,2-DCE (4,400 μg/L), trans-1,2-DCE (400 μg/L), benzene (130 μg/L), toluene (23,000 μg/L), and chloroform (45 μg/L). The maximum concentrations were detected in samples collected from wells WCC-1S and WCC-3S.

Chemical constituents detected in well DAC-P1, located north of the Subject Property along the western boundary of the facility, included TCE (20,000 μg/L). Quarterly monitoring dating back to 1987 for well DAC-P1 does not show significant changes in TCE concentrations. Recent data for the remaining analytes have been consistent with historical monitoring data.

In a technical memorandum dated 5 July 1994, Kennedy/Jenks reviewed available environmental regulatory agency files to evaluate the potential for the onsite migration of VOCs from offsite sources. In the memorandum, Kennedy/Jenks identified three sites with the potential to impact the groundwater beneath the Subject Property. Industrial Molding Company (IMC), located at 2015 West 190th Street, is located approximately 3/4-mile west and upgradient of the C-6 facility. Previous operations at the IMC facility produced paint sludges, polymeric resin wastes, oil/water sludges and metal dust. Risto-Los Angeles, located at 1441 West 190th Street, north of the C-6 facility, manufactures industrial and refrigeration machinery and equipment. The California Department of Toxic Substance Control identified Risto as a site for preliminary environmental assessment. The potential impact of this location on the Subject Property is not known. ILM, located at 19200 South Western Avenue, is adjacent to the Subject Property to the west. Wastes generated at the ILM facility included spent acidic and caustic sludges, spent petroleum solvents, polychlorinated biphenyls (PCBs) and spent 1,1,1-TCA. Both petroleum solvents and chlorinated solvents were stored in USTs at the site.

In a report dated 12 June 1991, Kennedy/Jenks performed sampling of the monitoring wells installed for the Montrose Site Remedial Investigation and performed a review of technical documents regarding historical activities at the both the Montrose site and the Subject Property (Kennedy/Jenks, 1991). The report was prepared to investigate the occurrence of chloroform and chlorobenzene in the vicinity of the Subject Property and to evaluate the possibility that these chemicals could have originated from releases at the Montrose site. Analytical data compiled from May 1989 to February 1991 for the report indicated that chloroform concentrations in well MW-09, screened in the shallow aquifer, ranged from 28,000 μg/L to 85,000 μg/L. Chlorobenzene concentrations ranged from 77,000 μg/L to 180,000 μg/L. The report concluded that the chloroform and chlorobenzene concentrations encountered in the shallow aquifer were associated with releases at the Montrose site and had migrated northward due to either upper unsaturated zone geologic structures, localized piezometric differences caused by a settling pond on the Montrose property, or a combination of both.

4.0 ENVIRONMENTAL RECORDS REVIEW

The following section summarizes information obtained during the review of available regulatory agency database listings and facility records supplied by DAC.

4.1 Regulatory Agency Records Review

Kennedy/Jenks conducted a review of available environmental regulatory agency database listings for references to the Subject Property and to evaluate the presence of adjoining properties that may be of concern to the Subject Property. Kennedy/Jenks retained Vista Environmental Information, Inc. (Vista) to assist with the database listing search.

Vista performed a review of 17 pertinent environmental regulatory agency databases. The database search included 141 references within five-eighths of a mile of the Subject Property (including the Subject Property), 27 references within five-eighths to three-quarters of a mile, 22 references within three-quarters to one mile, and eight references within one to one and one-half miles. The C-6 facility appeared on seven of the databases searched:

- A reference to DAC exists in an EPA database list of large quantity generators who generate at least 1000 kilograms per month of hazardous waste.

- The C-6 complex appears on both a state and regional database listing of sites with leaking USTs. Both references indicate that groundwater was impacted by solvents.

- There are three references to the C-6 facility on the state database list of facilities with USTs. The three references indicate an inconsistent number of USTs at the C-6 facility.

- The C-6 facility appears on the CERCLIS list, an EPA-maintained database list of sites either proposed or current National Priorities List (NPL) and sites which are or were in the screening and assessment phase for possible inclusion on the NPL. CERCLIS sites designated as "No Further Remedial Action Planned (NFRAP)" may be sites where an initial investigation found that there were no environmental impacts, environmental impacts were removed quickly without need for the site to be placed on the NPL, or the environmental impact was not serious enough to require NPL consideration. The database reference indicates that the C-6 facility is currently an NFRAP site.

- Four references were recorded on the Emergency Response Notification System (ERNS) database. The ERNS database is a collection of reported releases of oil or hazardous substances made to federal authorities including the EPA, the US Coast Guard, the National Response Center, and the Department of Transportation. Two of the references are linked to a release of an unknown amount of nitrogen dioxide gas on 15 December 1993. The third reference is related to a spill of an unknown amount of a petroleum hydrocarbon. The fourth reference is related to a spill of hydrofluoric acid. In all of the cases, the agency to which the release was reported was not included in the database information.

Several properties adjacent to the C-6 facility appeared in the database listings.

- Lawson Enterprises, Inc., located at 19500 South Normandie Avenue, is on the database list of proposed, current, or deleted NPL sites. The database listing indicates that no further remedial action was planned as of 1 June 1986. Jay Steinbeck is noted on the state-maintained list of USTs at the same address as Lawson Enterprises. This site is located east of the Subject Property across South Normandie Avenue.

- Pacific Gateway at 19525 South Normandie is referenced on a database list of small quantity hazardous waste generators. This site is located east of the Subject Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- Alpine Foreign Car Service at 19530 South Normandie Avenue is referenced on the database list of large quantity generators. This site is located east of the Subject

Property across South Normandie Avenue. The database reference does not indicate the type of wastes produced at this site.

- The Del Amo Facility, a 3.7 acre area located about one-quarter mile to the southeast of the Subject Property, appears on the EPA's National Priority List, California Department of Toxic Substances Control's State Priority List, and on the CERCLIS list. The database listing indicates that EPA has taken regulatory responsibility for the site and that remedial investigations are currently under way. The Del Amo facility was used as a waste disposal area for local rubber manufacturers from 1942 to 1969. Sampling of groundwater at the Del Amo site has indicated the presence of polynuclear aromatic hydrocarbons and VOCs in the groundwater (Kennedy/Jenks, July 1994). The VISTA map illustrates both the area of the site and offsite areas being screened as part of the site assessment.

- The site at 1225 West 196th Street is referenced six times in the databases reviewed. This site borders South Normandie Avenue to the west and is southeast of the Subject Property. American Polystyrene appears on the database list of large quantity hazardous waste generators and on a database registry of users of hazardous chemicals known as the Toxic Release Inventory System (TRIS). The TRIS reference indicates that chemicals used at the site include styrene and ethylbenzene. Amoco Chemicals at the same address appears on the EPA CERCLIS list, the state CERCLIS list, and on the CORTESE list, a state-maintained list of sites with hazardous materials releases. Amoco is also on the ERNS list for a 5,000 pound release of styrene gas on 7 September 1990.

- Greene's Ready Mix Concrete at 19030 South Normandie Avenue appears on a state-maintained list of UST owners and on a state-maintained list of leaking UST owners. The leaking UST reference indicates that the release was cleaned up and that the case has been closed. This site is located to the east of the Subject Property across South Normandie Avenue.

- A Texaco station located at 19008 South Normandie appears on the state-maintained list of UST owners. The gas station is located east of the Subject Property on the southeast corner of West 190th Street and South Normandie Avenue.

- South Bay Corp. at 1411 West 190th Street appears on the state-maintained list of leaking UST owners, a regional list of leaking UST owners, and on the CORTESE list. The database references indicate that a UST containing diesel has released an unknown quantity of fuel. The references also indicate that no remedial actions have been taken by the responsible party. This site is north of the Subject Property across West 190th Street.

- The facility adjacent to the Subject Property to the west, located at 19200 South Western Avenue, appears on seven databases. The site appears twice on the CORRACTS list, a list of facilities which have received a corrective action order from the EPA due to a release of hazardous materials or wastes into the environment. The CORRACTS reference for a Northrop Corporation at this site indicates that no further action is necessary. The CORRACTS reference for a Martin Marietta facility at this location indicates that further corrective action is necessary, but that the site has a low prioritization status. The site also appears on the CERCLIS list and the state-equivalent CERCLIS list. The database listing on the CERCLIS list indicates that the site is undergoing preliminary assessment activities; the database listing for the state listing indicates that no further action is required at the site. The site appears again on the CERCLIS list as Martin Marietta Aluminum. This reference indicates that the site is still in discovery status. The site appears on the state lists of aboveground storage tanks (ASTs) and USTs; no further information about the site is available from these reference listings. Six references in the ERNS database shows that the following releases of hazardous materials occurred:

An unknown amount of waste oil and lubricants were spilled on the site on 1 February 1990.

400 gallons of oily water were spilled on 3 August 1990. This incident has two listings in the ERNS database.

900 gallons of chromic anhydride were discharged to the sewer system on 25 October 1991.

100 gallons of oil were spilled on 29 May 1990. (This incident has two listings in the ERNS database.)

- The former Montrose Chemical facility located directly adjacent to the C-6 facility to the south appears on five databases. The site is listed on the NPL, SPL, and CERCLIS list. The site is currently on the NPL due to releases of DDT to groundwater.

4.2 DAC Documents

Kennedy/Jenks reviewed environmental documents for operations at the C-6 complex supplied by DAC Environmental Services. These documents included UST removal reports, remediation reports, site assessment reports, historical drawings, and a technical memorandum. The following sections summarize the findings of the document review process that pertain to the Subject Property.

<u>UST Removal and Soil Remediation Reports</u>

Kennedy/Jenks reviewed several UST removal reports for USTs removed from the C-6 complex. The reports detailed tank removal activities of 21 USTs from various locations throughout the Subject Property. In most cases, the reports indicated that some soils surrounding the tanks had been impacted by petroleum hydrocarbons, but confirmation sampling following further excavation indicated that soils with hydrocarbon concentrations above regulatory limits had been removed.

However, soils with concentrations of total petroleum hydrocarbons (TPH) greater than 100 milligrams per kilogram (mg/Kg) were left in place at tanks 27T (Building 2, west patio 2-GG-51-54), 28T (Building 2, west patio 2-GG-41-44), and 31T (Building 2, east patio 2-U-11-14) because further excavation would have destabilized present structures (Crosby & Overton, October, 1988). The excavations were left open and re-sampled several years later for gasoline by modified EPA Method 8015 and for benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020. According to DAC personnel, the analyses indicated that concentrations of the chemicals of concern were below detection limits. The excavations were subsequently backfilled.

In 1994, six USTs were removed by Maness Environmental. Two 50,000 gallon fuel oil USTs were removed from the north side of Building 41. Two 7,500 gallon and two 500 gallon hydraulic oil USTs were removed from the east side of Building 1. Soils found with elevated concentration of TPH were excavated and disposed (Maness, 1994).

Woodward-Clyde Consultants performed two soil borings in Building 41 in 1987. A soil sample collected from 50 feet bgs was analyzed be EPA Method 418.1 for TPH and found to contain 19,000 mg/Kg of TPH. Soil samples collected from another boring indicated TPH concentrations of 13,000 mg/Kg at 25 feet bgs and 4100 mg/Kg at 30 feet. The source of the petroleum hydrocarbons is believed to be from leaking product line leading from former USTs on the north side of the building (Woodward-Clyde, 1987).

Three 5,000 gallon solvent USTs and one 3,000 gallon waste solvent UST were removed from the exterior breezeway between Buildings 1 and 36 in 1991. Analysis of soil samples collected from beneath the tanks indicated that the surrounding soils had been impacted by petroleum hydrocarbons and VOCs. The impacted soils were left in place for future management by DAC (Emcon, 1992). During further assessment of the impacted area, soils were found to contain TCE and methyl ethyl ketone (MEK) at up to 60 feet bgs. It was estimated that the lateral extent of impacted soils extends in a southeast direction beneath Building 1 (Montgomery, 1994). Remediation activities are on going.

Site Assessment Reports

Kennedy/Jenks reviewed separate Phase I and Phase II site assessments performed by CDM for DAC in 1991. A Phase I was performed for two parcels at the C-6 complex: the northern parking lot that is part of the Subject Property and the tool storage yard located to the southwest of the C-6 complex. CDM concluded that neither of the parcels appeared to have been used for the generation or storage of hazardous wastes or substances. Based on groundwater monitoring results that showed elevated concentrations of TCE , CDM recommended sampling along the western fence of the parking lot to investigate the possibility that activities at the adjacent facility to the west had impacted the subsurface beneath the Subject Property.

For the Phase II assessment, CDM advanced three soil borings in the parking lot to a total depth of 31.5 feet bgs. The soil samples were analyzed for VOCs, priority pollutant metals, PCBs, and organochlorine pesticides. Based on the analytical results that showed all analytes at concentrations below regulatory limits, CDM concluded that further investigation of the parking lot subsurface was not necessary.

In Building 2, deteriorated concrete pads were discovered beneath chromic acid tanks that were removed from the area near column 2-X-11 in 1988. Soil borings advanced to 31 feet showed elevated concentrations of chromium. Soils with total chromium concentrations greater than 50 mg/Kg were removed. However, some soils with concentrations as high as 170 mg/Kg were left in place in the north wall of the excavation to maintain the stability of the building. Lateral migration of the chromium in the south wall of the excavation had been limited to a few feet. (Woodward-Clyde, May 1988).

Subsurface sampling in the area of former chrome plating tanks in 1989 indicated that hexavalent chromium concentrations ranged from 80 mg/Kg at 7.5 feet bgs to 1400 mg/Kg at 2.5 feet bgs (Environmental Solutions Inc., 1989). DAC was advised to remove the upper 5.5 feet of soil. According to DAC personnel, soils were removed until total chromium concentrations were below 50 mg/Kg, and the excavation was backfilled.

Historical Drawings

Historical drawings provided by DAC included an Aluminum Company of America (ALCOA) drawing dated 25 February 1942 entitled "Bldg. #68 - 5000 bbl. Fuel Oil Tanks and Pump House Foundations - Plan and Details, another ALCOA drawing dated 3 May 1943 entitled "D.P.C. - Fuel Storage Tanks - Their Location", a DAC drawing originally dated 3 September 1963 entitled "Master Shore Station Development Plan", and as-built drawings and demolition plans for the additions performed on the Subject Property dated May 1968. Other drawings made available by DAC included demolition plans and as-built drawings from 1952 to 1953, original floor plans from 1944, and a C-6 facility plot plan from 1984.

Several USTs were also located to the east of Building 20 (north of the Subject Property). Three transfer lines led to the south onto the Subject Property and east towards Building 1.

According to the 1943 ALCOA drawing, one UST was located approximately midway between the northwest corner of Building 1 and Building 29.

A 1952 demolition drawing indicates that there were six pits and sumps ranging in depth from six feet to nine feet in the northeast corner of Building 1. The drawing does not indicate the contents or the condition of the pits prior to demolition. There were also six fuel oil USTs in two locations in Building 1. The demolition plan indicates that the USTs were to be removed. A floor plan from the original structure shows a pit of unknown depth near column 1-R-28 (there is no present indication of the location of this pit).

Available floor plans from as-built drawings dated September 1953 for Building 2 show that sumps or pits were located in the following areas:

Four 3-foot pits near column 2-PP-5 (there is no present indication of the location of these pits);

One 18-inch pit north of column 2-JJ-3 (there is no present indication of the location of this pit);

One pit of unknown depth between columns 2-A-1 and 2-A-3 (there is no present indication of the location of this pit);

Two pits of unknown depth north of columns 2-A-1 and 2-B-1 (there is no present indication of the location of these exterior pits);

Five "conveyor pits" south of columns 2-P-50 through 2-U-50 (concrete patches indicate the former location of these pits);

One settling basin of unknown depth near column 2-JJ-51 (there is no present indication of the location of this basin);

One "conveyor pit" south of column 2-TT-51 (a concrete patch indicates the former location of this pit);

One settling basin of unknown depth between columns 2-TT-41 to 2-TT-44 (there is no present indication of the location of this basin);

The C-6 plot plan illustrates the type of operations that were being performed in each area of the facility in 1984. The following areas of environmental interest were noted on the drawing:

> Operations in the northeast and east area of Building 1 included chemical milling and etching;
>
> A chrome removal system, a coolant recovery system; and an oil filtration system were located on the east side of Building 1 (all equipment associated with these systems have been removed);
>
> Metal machining, grinding, and fabrication operations were located throughout Building 1;
>
> A degreasing area was located in the vicinity of column 2-PP-10 in Building 2;
>
> An x-ray lab was located in the vicinity of column 2-W-28 in Building 2;
>
> A chemical lab was located in the vicinity of column 2-W-46;
>
> A cyanide storage building occupied the present location of Building 45;

<u>Technical Memorandum</u>

A technical memorandum written by Kennedy/Jenks and dated 5 July 1994 summarizes the result of an assessment for the potential onsite migration of VOCs from offsite areas and assesses the value of installing offsite monitoring wells to evaluate groundwater conditions upgradient from the C-6 complex. The report identified three sites with a potential to impact groundwater quality beneath the Subject Property and concluded that further offsite subsurface investigation would not aid in the identification or remediation of impacted groundwater beneath the C-6 facility.

The three sites identified were:

- the former ILM facility adjacent to the Subject Property to the west;
- the Industrial Molding Corporation facility located approximately 3/4-mile west of the Subject Property; and
- the Risto-Los Angeles facility located to the north of the Subject Property across West 190th Street.

The report suggested that an offsite source or sources have significantly contributed to concentrations of solvents detected in a groundwater monitoring well located on the Subject Property within the C-6 complex.

4.3 Sanborn Fire Maps

Kennedy/Jenks retained Vista to perform a Sanborn Map-Site Search for the Subject Property. Sanborn certifies that no Sanborn Maps are available for the Subject Property.

5.0 SITE WALK-THROUGH OBSERVATIONS AND INTERVIEWS

The following sections summarize observations and areas of potential environmental interest noted during the site walk-throughs and during interviews with DAC personnel.

5.1 Hazardous Substance and Waste Handling

Because most the Subject Property is now used for storage and most heavy equipment has been removed, it is difficult to assess hazardous substance and waste handling practices when the manufacturing activities were in operation. Currently, there are few hazardous materials used at the facility. Hazardous wastes generated at the facility include mostly soiled rags, paint waste, and aerosol cans.

Conditions at the hazardous waste accumulation area (Building 45) appeared to be in good condition and in compliance with applicable regulations.

Drums of MEK, 1,1,1-TCA, and butanol were observed in a former paint area near column 2-G-50. The drums were stored on crates directly on the floor. Approximately 15 crates consisting of 6 to 12 5-gallon canisters of perchloroethene were also observed in this area.

Floor drains in a room to the west of west patio 2-UU-31-34 had dark staining in them. The room appeared to be a former air compressor area.

Concrete containment pads remain at the former location of the chrome removal system, the coolant recovery system, and the oil filtration system located on the east side of Building 1. The containment pads appeared to be in good condition with some rust-colored staining.

A wash pad located west of Building 66-1 was observed to be heavily stained with a dark, oil-appearing substance.

In the tool storage yard, moderate stains were observed on the asphalt in front of buildings 54 and 55, where the forklifts and service vehicles are normally parked.

A waste oil pump with temporary holding tank was located in the storage area at the southern end of the Subject Property. A small oil stain has formed on the asphalt beneath the lower outlet of the holding tank.

A drain in the storage area at the southern end of the Subject Property had moderately dark stains on the asphalt around it.

5.2 USTs, Sumps, and Clarifiers

No USTs are present on the Subject Property (Parcel C). Two USTs and a two-pump fuel island are present on the east side of Building 20, immediately north of the Subject Property. DAC records indicate that one steel-walled tank at Building 20 containing gasoline has been tested and passed annually. One two-compartment double-walled fiberglass tank has been tested every five years since being installed in 1988. This tank passed its last test in 1993. The DAC records show that the USTs at Building 20 are in compliance with state regulations governing UST integrity testing.

One clarifier was observed on the north side of Building 41; one clarifier was also observed on the south side of the Building.

Clarifiers were observed in Building 2 at east patio 2-EE-41-44 and at west patio 2-UU-31-34.

Two 30-foot deep pits in a former steel heat treating area in the vicinity of column 2-CC-39 were full of concrete and debris. According to DAC personnel, the pits were former containment areas for dip tanks and a Gantry furnace. DAC personnel did not believe that large quantities of liquids were consistently contained in the pits. The construction date of the pits is unknown. Historical drawings indicate that there is a collection sump at the center of the south wall of each pit.

DAC personnel indicated that metal treating dip tanks were removed from the area between columns 2-TT-25 and 2-MM-25. Upon removal of the tanks, it was discovered that the pit was lined with bricks. The bricks were removed and the pit was backfilled and capped with concrete. No environmental sampling of the soils beneath the pits was performed.

5.3 ASTs

A process line consisting of 12 empty dip tanks in a western annex of Building 1 was a titanium treating area. Chemicals used in the process included nitric acid, hydrofluoric acid, sodium hydroxide, and potassium hydroxide. A wash rack or rinse rack against the western wall of the room was coated with a white precipitate.

Empty process tanks from a metal etching operation in an enclosed area on the east side of Building 1 are still in place. The tanks were not labeled. Some of the tanks are coated with precipitate.

A process line consisting of six empty dip tanks from an aluminum milling operation in the eastern enclosed area between Building 1 and 2 is still in place. These tanks are approximately 15 feet tall. Labels on the tanks indicate previous chemicals used included sodium hydroxide, sodium Polysulfide, sodium thiosulfate, nitric acid, and sulfuric acid. ASTs for the process lines were located on the eastern exterior of the enclosed area. The ASTs have been removed.

An empty polypropylene tank labeled as a cyanide solution tank was located in the west patio at 2-UU-31-34.

Approximately 43 empty dip tanks in a metal treating area at column 2-UU-29 are still in place. Many of the tanks are coated with varying degrees and types of precipitate. Labels on the tanks indicate that the tank contents included cadmium oxide, sodium cyanide, sodium carbonate, sodium hydroxide, cadmium anodes, copper anode, chromic acid, nitric acid, hydrochloric acid, formic acid, hexavalent chrome, stoddard solvent, sulfuric acid, and phosphoric acid. The floor surrounding the tanks appears to be coated with a sealant and is covered with fiberglass grating. DAC personnel indicated that the floors in this area were usually wet. Most of the tanks have some type of precipitate coating.

An empty dip tank was located at the storage area at the southern end of the Subject Property. A label on the tank indicates that chromic acid was used in it. In addition, several wire mesh dip tank baskets of various sizes are located in the storage area.

5.4 Asbestos-Containing Materials

A survey for potential asbestos-containing materials was not performed as a part of this PESA. According to MDRC personnel, an asbestos survey has already been performed on the Subject Property.

Asbestos was commonly used in building materials prior to 1977. Based on the age of the facility, it is likely that asbestos-containing materials are present on the Subject Property.

5.5 PCBs

Fluorescent light ballasts and electrical transformers manufactured prior to 1977 may contain oils with PCB concentrations requiring special management. Electrical transformers may also contain oils with PCB concentrations requiring special management.

Fluorescent light ballasts that appeared to be manufactured prior to 1977 were observed throughout the Subject Property.

All electrical transformers at the C-6 facility have been tested and labeled for the presence (or non-presence) of PCBs. According to DAC documents, there are three PCB-containing transformers in Building 1 and 13 PCB-containing transformers in Building 2.

5.6 Lead-Based Paint

Based on the age of the buildings on the Subject Property, lead-based paints are likely present.

6.0 CONCLUSIONS

Due to the age of the Subject Property, numerous renovations and additions, and the conversion of operations from manufacturing activities to storage and warehousing, it is difficult to assess past environmental impacts. However, several definitive areas of environmental interest were identified during the PESA. These areas relate to past manufacturing processes, hazardous materials usage areas, clarifiers, USTs, ASTs, areas identified on facility drawings, and impact from adjacent properties.

There is a possibility that any release of a hazardous substance could have impacted surrounding soils at the following areas on the Subject Property:

- The former location of the chrome recovery system, the coolant recovery system, and the oil filtration system on the east side of Building 1;
- Chemical etching operations in the northeastern areas of Building 1;
- Several pits and sumps of unknown contents and depth in the northeast corner of Building 1 that were removed during renovation activities in 1952;
- Former USTs located midway between Building 2 and Building 29 and fuel transfer lines leading from USTs on the east side of Building 20 to Building 2.
- Numerous pits and sumps noted on as-built floor plans for a 1953 renovation of Building 2;

- A degreasing area near column 2-PP-10 in Building 2;
- Dark stained floor drains in west patio 2-UU-31-34;
- Clarifiers in Building 2 at east patio 2-EE-41-44 and west patio 2-UU-31-34;
- Machine pits located in Building 2 in the vicinity of column 2-CC-39;
- Former metal treating tanks located in Building 2 near column 2-TT-25 through 2-MM-25;
- Former metal treating tanks still in place near column 2-UU-29 and a former chemical storage area in the west patio to the south of the treatment tanks;
- Operations in a former maintenance building west of Building 3;
- Drain lines leading from a former photo lab in Building 15;
- Floor drains near air compressor in Building 41;
- Clarifiers located on the north side and on the south side of Building 41;
- A cyanide storage building located in the current area of Building 45;
- A dark stained concrete washing area west of Building 66-1;
- Dark-stained asphalt around a drain in the storage area at the south end of the Subject Property.

Residue and precipitate on process tanks and related equipment such as vapor hoods present areas of environmental interest. Areas of concern include:

- A process line consisting of 12 dip tanks in a western annex of Building 1;
- Empty process tanks in an enclosed area on the eastern exterior of Building 1;
- A process line consisting of six large dip tanks in an enclosed area between Building 1 and Building 2;
- Approximately 43 empty dip tanks and plating tanks located in the vicinity of column 2-UU-29 in Building 2.

Soils beneath Building 41 have been impacted by petroleum hydrocarbons; possibly from leaking fuel lines that supplied boilers in this building.

Chromium impacted soils were left in place during remediation activities in an area near column 2-X-11 in Building 2. Further excavation of impacted soils would have resulted in the destabilization of structural footing.

The Subject Property is within one-quarter mile of two EPA Superfund sites, one of which as adjacent to the Subject Property to the south. Elevated concentrations of chloroform and chlorobenzene have been detected in a monitoring well installed on the Subject Property near the southern boundary. These chemicals are believed to have originated from the Superfund site.

Quarterly sampling and analysis of groundwater collected from a monitoring well located near the western boundary suggests that solvents detected in the groundwater beneath the subject property may have originated at an offsite source.

Historical documents and quarterly groundwater sampling and analysis from a network of monitoring wells installed throughout the north central areas of the Subject Property suggests that groundwater beneath the Subject Property has been impacted by solvent releases from former USTs located between Building 1 and Building 36. Remediation activities by DAC are being implemented.

7.0 REFERENCES

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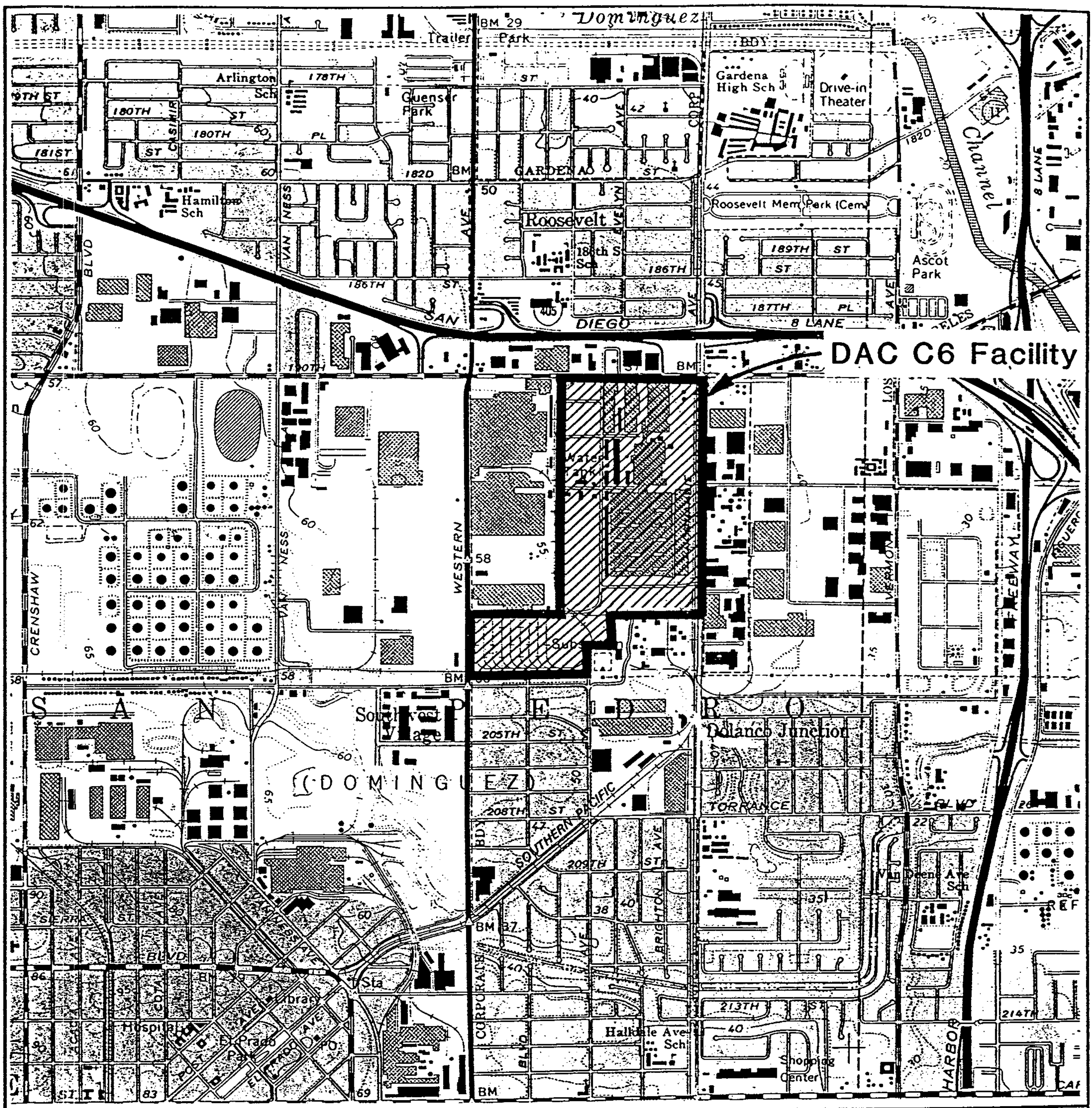


Base Map: U.S.G.S. 7.5 Minute Topographic Map, Torrance, California Quadrangle, 1981.

0 2000 4000

Approximate Scale in Feet

N

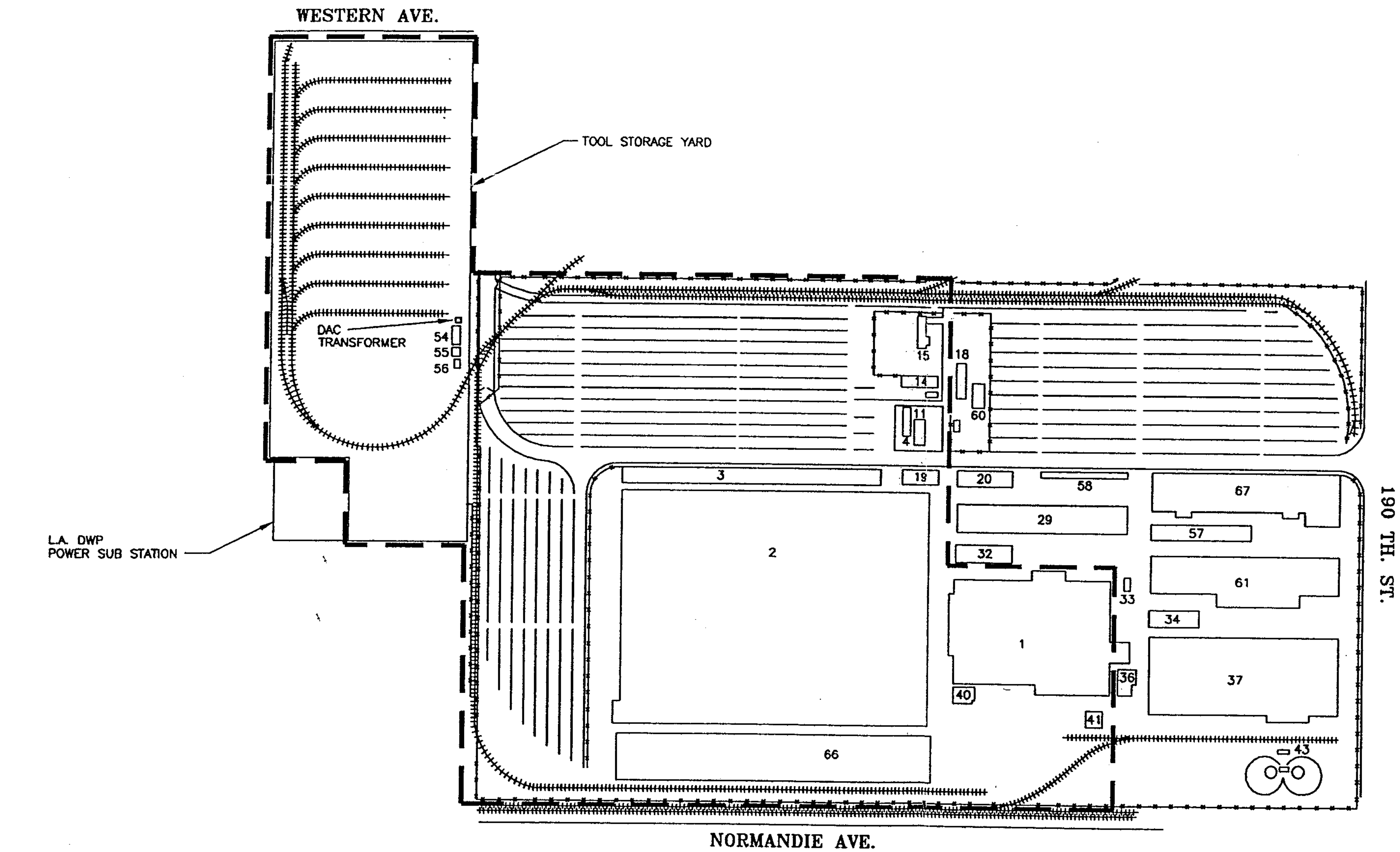
Kennedy/Jenks Consultants

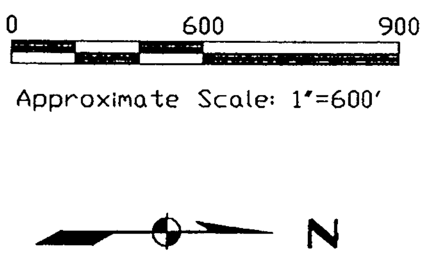
C–6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Site Vicinity Map

June 1996
K/J 954019.00

Figure 1





LEGEND

Approximate Subject Property Boundary

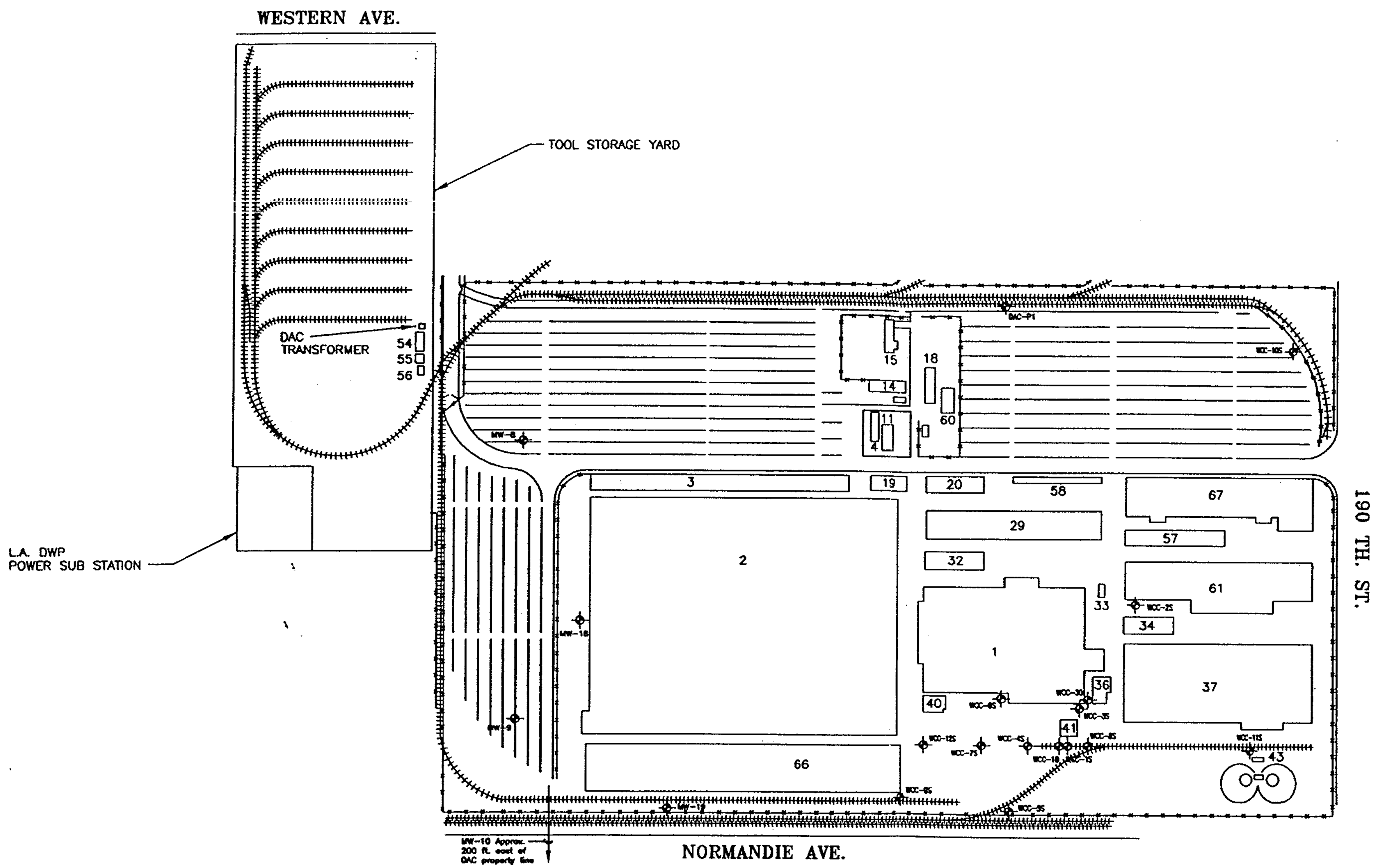
Kennedy/Jenks Consultants

C–6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Facility Layout and Subject Property Map

June 1996
K/J 954019.00

Figure 2



0 600 900

Approximate Scale: 1"=600'

N

LEGEND

WCC-1S Observation Well Location, Designation

NOTE:

1) Wells MW-8,-9,-10,-18, and -19 Installed by Montrose Chemical Corporation

Kennedy/Jenks Consultants

C-6 Douglas Aircraft Company Complex
19503 S. Normandie Ave.
Torrance, California

Monitoring Well Location Map

June 1996
K/J 954019.00

Figure 3

BOE-C6-0076132

EXECUTIVE SUMMARY
PHASE II SUBSURFACE INVESTIGATION
DOUGLAS AIRCRAFT COMPANY
C-6 FACILITY, PARCEL A
TORRANCE, CALIFORNIA

1.0 Introduction

McDonnell Douglas Realty Company (MDRC) is considering development of the northern section of the Douglas Aircraft Company C-6 Facility in Torrance, California, called Parcel A. In December 1995, MDRC retained Kennedy/Jenks to conduct a Phase I Environmental Site Assessment (PESA) of Parcel A. During the performance of the PESA, Kennedy/Jenks identified 17 areas of potential environmental interest related to past operations within Parcel A. MDRC retained Kennedy/Jenks Consultants to perform a Phase II subsurface investigation of these areas of potential environmental interest.

2.0 Areas of Environmental Interest

- Area 1, a concrete pad located on the north side of Building 34, is identified as the location of former clarifiers.
- Area 2 consists of two clarifiers located on the east side of Building 37.
- Area 3 includes 15 machine pits in Building 37. Large quantities of machine and hydraulic oils were collected in sumps within the pits during manufacturing operations.
- Area 4 includes a parts degreaser and collection sump in a machine shop in the eastern section of Building 37. Solvents including 1,1,1-trichloroethane were reportedly used in the degreaser.

- Area 5 consists of two elevators, and associated underground hydraulic equipment, on the north and south ends of Building 61.

- Area 6, located near the exterior northeast corner of Building 61, is identified as a former collection sump location.

- Area 7 consists of a collection sump, a secondary containment area for a metal process line, and a containment pit for a parts degreaser. These items are located in a room in the central western portion of Building 67.

- Area 8 is a clarifier located near the northwest exterior corner of Building 67.

- Area 9, located at the south end of Building 67, is identified as a former containment pit that housed an electric discharge machine in which dielectric oils were used.

- Area 10, located in the central eastern portion of Building 67, is identified as a former dark room in which x-ray film was processed.

- Area 11 consists of dark-stained floor drains and surrounding stained floor in a former air compressor room in the northeast section of Building 67.

- Area 12, southwest of Building 44, is reportedly the location of a former railcar fuel transfer station. Underground lines conveyed fuel from Building 44 to Building 41. In addition, the containment area around the above-ground storage tanks is identified as an area of environmental interest.

- Area 13 consists of two former underground storage tank locations near the middle of the current Building 29.

- Area 14 is a clarifier located in a paint booth in the central eastern section of Building 29.

- Area 15 is a concrete pad east of the northeast corner of Building 29. The pad is identified as a former hazardous waste accumulation area. Previous soil sampling had indicated that soils beneath the pad may have been impacted by TCE.

- Area 16 is Building 33, which was identified as a former location of cyanide solution storage.

- Area 17 is a clarifier located north of Building 36.

3.0 Subsurface Soils Investigation

The objective of this Phase II investigation was to evaluate the possibility that releases of hazardous substances could have impacted surrounding soils at the areas of potential environmental interest. The Phase II Investigation included subsurface soil sampling, monitoring for soil vapors during sampling, logging of soil types, and laboratory analysis for chemicals of interest anticipated from the PESA.

Samples were collected from depths of up to 35 feet below ground surface from 56 borings using hollow-stem auger, hand auger, and direct push techniques. Sample location numbers correspond to the number of the area of potential environmental interest. Upper interval samples from each boring were generally analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH) or Total Petroleum Hydrocarbons as diesel (TPHd), and volatile organic compounds (VOCs) by a mobile laboratory located onsite. Deeper interval samples were analyzed for the same parameters where upper interval samples had detectable concentrations of chemicals of interest. In general, samples were also analyzed for California Code of Regulations metals in an offsite laboratory and select samples were also tested for polychlorinated biphenyls (PCBs). Analytical work was conducted by California certified laboratories using standard EPA test methods and appropriate state-required modifications.

Subsurface soils encountered at locations drilled during this Phase II investigation, were similar in classification. Drilling to a maximum depth of 35 feet bgs penetrated an interbedded unit comprised of fine-grained sediments. The predominant soil type to this depth is silt. The silt units vary in thin intervals to clayey silt, silty clay, and sandy silt. Clay and silty sand were also found interbedded in the silt unit. Boring logs indicate the subsurface sediments get sandier going to the west from Building 37. Soils are generally light brown to olive brown, with occasional gray silts noted. Though coloring was fairly consistent throughout the drilled areas, the silt varied from soft to hard.

Soils encountered were predominantly dry with occasional damp to moist intervals. No groundwater was encountered during the drilling of this field program. According to recent groundwater monitoring performed by Kennedy/Jenks for DAC (Kennedy/Jenks, 1996), local groundwater elevations range from approximately 15.5 feet to 16 feet below msl (approximately 65 feet bgs). Recent and historical data suggest that the groundwater flow direction is to the southeast.

4.0 Results

The results of the Phase II Investigation identified a limited number of areas of continued environmental interest.

Area 3

At machine pit F in Building 37 (sample site 3F), Benzene, Ethylbenzene, Toluene, and Xylenes (BTEX) concentrations in a sample collected from 5 feet bgs ranged from 5.0 μg/Kg (Benzene) to 58.6 μg/Kg (Ethylbenzene). BTEX concentrations were not detected at or above the detection limit of 5 μg/Kg in the 10 foot sample, suggesting that impact by BTEX does not extend to 10 feet bgs.

TRPH was detected at a maximum concentration of 5,700 mg/Kg at 5 feet bgs at machine pit G in the north end of Building 37 (sample site 3G). TRPH was neither detected in the sample analyzed from 10 feet bgs at this location, nor detected in the closest samples to the south from machine pit H. These data suggest a small area of limited lateral and vertical extent of TRPH impacted soils that the contractor should be aware of during demolition.

At machine pit J in Building 37 (sample site 3J), PCBs were found at 10 feet bgs at a concentrations of 9,800 μg/Kg. PCB concentrations decreased with the depth in the succeeding sample to 130 μg/Kg. The Total Threshold Limit Concentration value (CCR Title 22) defines a California hazardous waste. For PCBs in soil, the TTLC value is 50,000 μg/Kg. These data suggest an area of limited vertical and lateral extent which should be monitored during demolition activities.

Volatile Organic Compounds (VOCs) were detected beneath the southernmost machine pits (pits O and K) in Building 37 (sample sites 3K and 3O). The highest concentration of individual VOCs beneath pit O was 1,1-DCE (76.6 μg/Kg) at 20 feet bgs and TCE (242.0 μg/Kg) at 20 feet bgs, and beneath pit K was 1,1-DCE (8.0 μg/Kg) at 10 feet bgs and TCE (97.0 μg/Kg) at 10 feet bgs. Both pits also had detections of TCE at 25 feet bgs. These data suggest the area may be impacted. This area should be monitored during demolition activities and soils may possibly need to be segregated if removed. This area is about 100 to 150 feet north of an area of previously detected VOCs and may reflect the northwestern extent of the area which originates outside of Parcel A.

Area 12

TPHd was detected at a highest concentration of 200 mg/Kg at 15 feet bgs north of Building 44 near the location of the former fuel transfer line (sample site 12-B). TPHd was not detected in the samples from 5, 10, 20, and 25 feet bgs in this location, suggesting a limited vertical extent of impacted soils.

Area 15

VOCs were detected at the former waste accumulation area north of Building 29 (sample site 15) to a total depth of 25 feet bgs. The highest concentration of individual VOCs was 60.0 μg/Kg 1,1-DCA (25 feet bgs), 202.0 μg/Kg PCE (25 feet bgs), 18.6 μg/Kg 1,1-DCE (25 feet bgs), 13.5 μg/Kg 1,1,1-TCA (25 feet bgs), 24.5 μg/Kg 1,1,2-TCA (10 feet bgs) and 200.0 μg/Kg TCE (25 feet bgs).

This area should be monitored during demolition activities and soils may possibly need to be segregated if removed.

Area 17

VOCs were detected at the clarifier adjacent to Building 36 at 25 feet bgs (sample site 17). The highest concentration of individual VOCs, primarily found at 25 feet bgs, was 1,1-DCE (162 μg/Kg), cis-1,2-DCE (19.2 μg/Kg) and TCE (272 mg/Kg). Of these compounds, only TCE had detections at shallower sampling levels. 1,2-DCA was found in the 10 foot sample at 30 μg/Kg. This area is immediately north of an area of previously detected VOCs and may reflect the northwestern extent of the area which originates outside of Parcel A.

5.0 Recommendation

Either prior to or in conjunction with the demolition of the buildings contained on Parcel A, Kennedy/Jenks recommends that MDRC monitor the areas of continued environmental interest identified in the Phase II Subsurface Investigation. Data generated by additional monitoring, as well as any other Parcel A site investigations undertaken by MDRC, could become the basis of a Remediation Plan, if any is required. Such a Plan would be subject to appropriate regulatory review, approval and oversight until completed.

Kennedy/Jenks/Chilton

REPORT OF TECHNICAL DOCUMENTS REVIEW AND GROUNDWATER SAMPLING

MCDONNELL DOUGLAS CORPORATION
DOUGLAS AIRCRAFT COMPANY, C6 FACILITY
TORRANCE, CALIFORNIA

K/J/C 904020.00

12 June 1991

Kennedy/Jenks/Chilton

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12 June 1991

McDonnell Douglas Corporation
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Cypress, California 90630

Attention: Noelia Marti-Colon, Esq.

Subject: Report of Technical Documents Review
and Groundwater Sampling
McDonnell Douglas Corporation
Douglas Aircraft Company, C6 Facility
Torrance, California
K/J/C 904020.00

Kennedy/Jenks/Chilton is pleased to submit this report pursuant to the Scope of Services contained in Task Order Nos. 1 and 2 of the 24 September 1990 contract (GMA-3408-C) between McDonnell Douglas Corporation (MDC) and Kennedy/Jenks/Chilton for consulting services in connection with Douglas Aircraft Company (DAC) C6 Facility in Torrance, California.

Please contact us if you have any questions or need additional information.

Very truly yours,

KENNEDY/JENKS/CHILTON

Richard G. Wilson

Richard G. Wilson, P.E.
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Project Engineer

RGW:JFL/sls

EXECUTIVE SUMMARY

This report summarizes the findings of an analysis of environmental conditions that could have resulted in the presence of chloroform concentrations reported in samples of shallow groundwater beneath the Douglas Aircraft Company (DAC) C6 facility located at 19503 South Normandie Avenue in Torrance, California. The findings of the technical document review and groundwater sample analyses indicate that chloroform occurrence in the Upper Bellflower Aquitard at the location of monitoring well MW-9 is associated with chemical releases at the Montrose Chemical Corporation Superfund site.

The DAC C6 Facility is located immediately to the north of the Montrose Site, which is the subject of a Remedial Investigation (RI) being conducted at the direction of the United States Environmental Protection Agency (EPA) under Administrative Order on Consent, EPA Docket Number 85-04. The Montrose Site is owned by Montrose Chemical Corporation of California and is the former site of a dichlorodiphenyltrichloroethane (DDT) manufacturing plant that was operated by Montrose between approximately 1947 and 1982. As part of the RI, several shallow groundwater monitoring wells were constructed on DAC C6 property. Reproducible analytical results for groundwater samples collected from these wells indicate the presence of appreciable concentrations of chloroform and chlorobenzene in shallow groundwater in one area beneath the DAC C6 property. While the source of both chlorobenzene and chloroform appears to be the former Montrose manufacturing plant, the possibility that the chloroform detected in groundwater is not related to the DDT manufacturing operation and that it may have originated from a different source, has been postulated by Hargis & Associates, Inc. (letter to U.S. Environmental Protection Agency, dated February 6, 1990).

The scope of the analysis included a review of available public documents, aerial photographs, and information on local and regional environmental conditions; examination of chemical fate and mobility considerations; and evaluation of hydrogeologic conditions. This report also contains results of groundwater sampling and analysis, which was conducted to evaluate whether the occurrence of chloroform in shallow groundwater in the vicinity of the DAC C6 and Montrose properties is correlated to possible "indicator compounds" of chemical release at the Montrose Site.

Possible sources for introduction of significant masses of chlorobenzene and chloroform into the subsurface environment on the Montrose Site appear to be: (1) the former railroad tank car off-loading areas in the northeastern and southeastern portions of the Montrose property, and (2) the wastewater settling pond formerly located in the north-central portion of the Montrose property. The first potential source area consisted of rail spurs where tank cars containing the raw materials for DDT production were spotted and their contents transferred to fixed storage facilities. The off-loading operations involved connecting appropriately sized hoses/piping to the tank car and pumping the contents, via fixed pumping stations, to above-ground tanks. Such operations often result in some spillage of the liquids being transferred, particularly during the disconnecting of hoses and manipulation of tank car valves. The principal raw material for DDT production, which was received in bulk rail deliveries along this spur for many years was a mixture of chlorobenzene and chloral. Because chloral is unstable in the presence of oxygen, it was delivered pre-mixed with chlorobenzene (approximately one part chloral to 1.5 to 1.8 parts chlorobenzene). This mixture was subsequently enriched during the DDT production process to the 2:1 ratio of chlorobenzene to chloral required for DDT synthesis. The chlorobenzene/chloral mixture delivered to the Montrose Site was produced at a Montrose Chemical Corporation facility located in Henderson, Nevada, which reported that the chloral produced for the mixture also contained about 0.1 to 0.2 percent chloroform by weight. Historical aerial photographs confirm that the area of the tank car bulk transfer operations was unpaved for many years. This area is, therefore, regarded as a location where it is probable that significant masses of both chlorobenzene and chloroform could have been co-released to the subsurface environment.

The second potential source area, the wastewater settling pond, is significant both as a location of possible discharge of chemicals to the subsurface environment and as an important potential influence of chemical transport in that environment. During its years of operation as a DDT production facility, Montrose maintained a runoff and wastewater "settling" pond on the north-central portion of its property. The pond, which measured approximately 75 feet by 50 feet by 15 feet deep, received wastewater from plant operations and runoff from the central processing area. In its early years of operation (i.e., prior to 1970), the pond was unlined and functioned as a settling basin along the main wastewater discharge line from the plant. In 1970, the pond was lined with concrete and incorporated into a water recycling system that was designed to reduce the amount of wastewater discharged from the facility. Because the flow of runoff water into the pond was largely unregulated and because monitoring of water accumulated in the pond appears to have been limited to general water quality indicator parameters such as pH and total dissolved solids, the types, concentrations, and cumulative quantities of organic chemicals discharged to the settling pond cannot be documented. However, the operational history of the pond, as reconstructed from review of aerial photographs and documents contained in California Department of Health Services' files clearly suggest that virtually any of the DDT process chemicals could have entered the waters received by the pond. Because low pH water potentially entering nearby sewer lines was of concern to regulatory agencies, the pH of the water discharged from the Montrose facility through the pond was reportedly checked and neutralized or raised above 7.0 to address the regulatory concerns regarding acidic waters and corrosion.

Reviewing the information contained in the discussion above and considering known chemical reactions, the following possible sources of chloroform related to DDT production on the Montrose Site have been identified: (1) chloroform contained as an impurity in the chlorobenzene/chloral mixture that was used as the principal raw product for the synthesis of DDT, and (2) chloroform formed by hydrolysis of chloral. Chloral hydrolysis occurs more rapidly under alkaline (i.e., pH greater than 7.0) conditions. Chloroform contained in the chlorobenzene/chloral mixture could have been released into the subsurface environment at the railroad tank car off-loading area, in solution with wastewater at the settling pond, or at any of a number of other areas on the Montrose Site where chlorobenzene/chloral mixture was stored or processed. Transformation of chloral to chloroform could have occurred in the DDT manufacturing process when the molten DDT was "washed" with caustic (sodium hydroxide) solution, in the settling pond during wastewater neutralization, or in the subsurface environment itself. Montrose Chemical Corporation has contended that the neutralization process used in DDT production did not constitute a strong base reaction and, therefore, chloroform would not be expected to form as a result of chloral decomposition. Even if this reasoning is accepted it does not preclude the possibility that the chloroform detected in the groundwater beneath the site originated as a result of chloral discharge on the DDT manufacturing site. Also, although the rate at which chloral is transformed to chloroform is most rapid under high pH (i.e., basic) conditions, this transformation can occur at slower rates under moderately basic or nearly neutral subsurface environmental conditions. Considering the elapsed time from the last DDT production activities to the present, even extremely slow-rate transformation mechanisms may account for the occurrence of chloroform beneath the site.

Review of groundwater monitoring data presented in the Montrose Site RI report indicates that the highest reported concentrations of chloroform in groundwater (e.g. 74,000 ug/L in April 1990) have been detected in samples collected from monitoring well MW-09 which is completed in the Upper Bellflower Aquitard (i.e., uppermost saturated zone) in a south parking area on DAC C6 Facility. Groundwater samples collected from this well have also contained appreciably higher concentrations of chlorobenzene (e.g., 180,000 ug/L in April 1990). Other wells where appreciable concentrations of chlorobenzene and chloroform have been consistently detected in groundwater samples include MW-1, MW-2, MW-5, MW-6, MW-11, MW-12, and MW-13. The reported chlorobenzene concentrations consistently exceed those reported for chloroform, which is consistent with the expected concentration relationship that would be expected to result from the discharge of the chlorobenzene/chloral mixture to the subsurface.

Monitoring well MW-09 lies hydraulically upgradient of the potential chlorobenzene/chloral mixture surface discharge locations described above, when "upgradient" is evaluated in terms of the apparent present-day piezometric and groundwater movement regimes in the Upper Bellflower Aquitard. This raises questions regarding the subsurface chemical transport mechanisms that might account for the presence of chlorobenzene and chloroform in the groundwater of the uppermost saturated zone some 230 feet north (upgradient) of the Montrose property boundary. Such chemical transport is significantly influenced by all of the following: (1) the concentration, quantity, and duration of the chemical release; (2) the geologic and chemical characteristics of the unsaturated zone, including sediment types, permeabilities, moisture contents, stratigraphic structure, and organic content; (3) hydrogeologic and chemical characteristics of strata comprising the uppermost saturated zone; (4) history of surface water percolation (recharge) through to the unsaturated zone in the chemical release vicinity, particularly transient events that occurred in the past; and (5) history of piezometric fluctuations and perturbations of the uppermost saturated zone. Consideration of the site-specific factors governing subsurface chemical transport in the vicinity of the DAC C6 Facility and the Montrose Site provides a reasonable and logical transport model that accounts for the presence of chlorobenzene and chloroform in groundwater that technically occurs hydraulically upgradient, in a lateral sense, from the probable surface release locations for these chemicals. In such a model, chlorobenzene and chloroform discharge to surficial soils on the Montrose Site at either the tank car off-loading area or the settling pond migrated northerly through either (1) spreading and structurally governed flow in the unsaturated zone, (2) migration in the uppermost saturated zone due to diffusion and/or localized, ephemeral perturbations in the piezometric surface resulting in north-flowing groundwater conditions, or (3) a combination of these phenomena. Physical site characteristics, historic practices/operations, and investigation information that support this model include:

1. Examination of lithologic logs of soil borings and monitoring wells from the Montrose RI show that the unsaturated zone beneath the Montrose and DAC C6 properties varies from about 60 to 70 feet thick and is comprised of interbedded sands, silts, and clays. The uppermost portion of the unsaturated zone (i.e., typically ground level to about 25 to 30 feet below ground surface or bgs) is predominantly silts and clays (fine-grained sediments). The lower portion of the unsaturated zone (i.e., the Palos Verdes Sand) is typically comprised of fine sand or silty sand. Based upon typically observed soil/water interactions and generally-accepted hydrogeologic principles, one would expect water (or aqueous solutions of organic chemicals) infiltrating at ground surface under constant head (i.e., settling pond conditions) and percolating through fine-grained unsaturated zone sediments, such as those present beneath the Montrose Site, to exhibit appreciable lateral (horizontal) movement or spreading away from the point of introduction to the subsurface. Accordingly, the steady-state saturated recharge "mound" (i.e., piezometric mound) that almost certainly penetrated the surrounding unsaturated sediments beneath the settling pond on the Montrose Site at times during the plant's historic operations, would have probably pushed waters discharging to the subsurface from the pond considerable lateral distances radially (in all directions) from the pond. Water migrating downward in the subsurface from the pond and spreading laterally as they did so, could have intercepted unsaturated zone areas already impacted by the surface discharge of chemicals of concern (e.g., the tank car off-loading area) and enhanced downward and lateral migration of the chemicals. Further, if chloral were present in soils beneath the tank car off-loading area, basic (alkaline) water recharging from the settling pond might have enhanced its transformation into chloroform.

2. Review of stratigraphic information presented in the RI boring logs indicates that there is at least one distinct unsaturated zone stratum that was encountered and recorded in the investigative borings. This stratum is a well-cemented fossiliferous sand consistently encountered between 30 and 40 feet bgs, that appears to be laterally continuous beneath the DAC C6 and Montrose properties. The Montrose Site's unsaturated zone is mainly comprised of marine sediments (i.e., deposited in a flat-lying configuration) that were probably deformed or uplifted at some time following deposition. This fossiliferous sand unit is an important key to the structure of the unsaturated zone sediments beneath the Montrose and DAC C6 properties, because most of the other sediments comprising the zone appear massive and undifferentiable when logging drill cuttings. Plotting the depth to occurrence of the fossiliferous sand indicates that this unit dips to the north on an angle of about one and one-half degrees from horizontal beneath Montrose. Because of the well-cemented nature of the fossiliferous zone and the implication that other unsaturated (and uppermost saturated) strata beneath the site also dip to the north, structurally-influenced preferential migration to the north of fluids percolating downward in the unsaturated zone to the water table is a viable hypothesis. The configuration of the occurrence of dense non-aqueous phase liquid (DNAPL) reported by Hargis + Associates in the RI appears to support the hypothesis of structurally-influenced preferential migration. The RI states: "Based on available data, DNAPL apparently occurs over an area extending several hundred feet east and north from the central process area" (page ES-7 in the RI Report). This is consistent with the hypothesis, assuming that the DNAPL was introduced into the subsurface in the central processing area.

3. The prolonged presence of the recharge mound discussed in item 1 above, during the years that the settling pond was unlined, would have resulted in localized areas of pronounced northerly flow conditions in the shallow groundwater beneath the site. Because of the low hydraulic conductivity of the sediments comprising the Bellflower Aquitard and the relatively flat hydraulic gradient in the aquitard under unperturbed conditions, chemicals introduced into the shallow groundwater of the Bellflower Aquitard in significant concentrations at a given location might remain for many years following dissipation of the recharge mound. This is because groundwater movement is normally extremely slow, sorption of organic chemicals to the fine-grained sediments probably occurs to an appreciable extent, and "flushing" of the uppermost saturated portion of the aquitard would not occur at a significant rate. In addition, chemical concentration gradients existing beneath the Montrose and DAC C6 properties probably favor diffusive migration away from the Montrose property (i.e., towards DAC) and do not promote natural flushing processes.

As a means of testing the chemical/transport model and supporting theories described in the foregoing, Kennedy/Jenks/Chilton recommend that selected groundwater monitoring wells on and around the Montrose Site (including MW-09) be sampled and the groundwater samples analyzed for para-chlorobenzenesulfonic acid (p-CBSA), a chemical known to be an unique synthesis by-product of DDT manufacturing. p-CBSA is considered to be an certain indicator chemical for contaminant mixtures suspected to have originated from DDT production and, therefore, its detection in a well that is located hydraulically upgradient of the Montrose Site would strongly support the conclusion that other chemicals (i.e., chlorobenzene and chloroform) detected in the well originated from DDT production activities. During January 30 through February 1, 1991, Kennedy/Jenks/Chilton sampled 15 monitoring wells at/near the Montrose Site.

Two significant conclusions were drawn from the results of the groundwater sampling and analysis investigation described above:

1. p-CBSA was detected in the groundwater sample collected from monitoring well MW-09. p-CBSA is a synthesis by-product of DDT manufacture and is unique to DDT production. Occurrence of this chemical in the sample from monitoring well MW-09 is a clear indication that wastes associated with DDT manufacture (i.e., the Montrose Site) migrated to the location of monitoring well MW-09.

2. Chloroform was detected in a sample of DNAPL collected from monitoring well MW-2, which is located on the Montrose property, at the approximate location of the former wastewater settling pond. The occurrence of chloroform in this material is further evidence that the Montrose Site is a source of chloroform to shallow groundwater.

These findings, along with the results of the technical document review, substantiate that the occurrence of chloroform and chlorobenzene in shallow groundwater beneath the DAC C6 property, particularly at/near the location of monitoring well MW-09, appears to be associated with chemical releases on the Montrose Site.

PRIORITIZATION ASBESTOS ASSESSMENT STUDY

C-6 TORRANCE FACILITY

for

McDonnell Douglas Corporation

Conducted By

Hall-Kimbrell Environmental Services, Inc.
Los Angeles, California

Report Number 0390513

FEBRUARY 9, 1990

EXECUTIVE SUMMARY

C-6 TORRANCE FACILITY
FOR MCDONNELL DOUGLAS CORPORATION

Hall-Kimbrell Environmental Services, Inc., was retained by McDonnell Douglas Corporation to conduct an inspection for possible asbestos-containing materials in the Douglas Aircraft, C-6 Torrance Facility. The inspection included the assessment of friable insulation, and fireproofing, as well as nonfriable building materials.

As a result of the inspection and laboratory analysis of bulk samples collected, four priority levels were generated to assist in planning and implementing a phased management program. Priority Level I areas contain materials which will require direct attention due to poor material condition and/or ease of public access. Priority Level II through IV areas contain materials with decreasingly lower exposure potentials. These materials should be repaired as necessary and monitored under an Operations and Maintenance Plan until removal is dictated by deteriorating material condition, renovation, or demolition.

Recent California legislation may require, within 15 days, that the contents of this report be made available to building tenants, and employees (AB3713, Connelly).

In addition, the California State Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) may require advance disclosure to affected parties prior to exposure. If indoor airborne asbestos fiber levels are significantly higher than outside airborne asbestos fiber levels a disclosure may be required. The determination of airborne asbestos fiber levels requires a comprehensive program of air monitoring which falls outside the scope of this study. Hall-Kimbrell Environmental Services recommends that McDonnell Douglas Corporation consult their legal counsel in order to determine their compliance requirements. As a vital segment of the to study, Hall-Kimbrell has provided budgetary cost estimates for removal/replacement of all asbestos-containing materials. A detailed listing of costs by priority level is shown below.

Priority Level	Removal Cost	Replacement Cost	Total Cost
I	$ 30,659.00	$ 5,908.00	$ 36,567.00
II	$ 145,069.00	$ 92,032.00	$ 237,101.00
III	$1,333,760.00	$ 357,240.00	$1,691,000.00
IV	$2,970,730.00	$4,118,894.00	$7,089,124.00
Total	$4,479,718.00	$4,574,074.00	$9,053,792.00

Please note: These costs do not include architectural/engineering, air monitoring, reimbursable, or contingency fees.

I. INTRODUCTION

Asbestos, once commonly referred to as the miracle mineral, has been used as a reinforcement fiber for more than 3,000 years. Because of the abundant availability of the fiber, its acoustical and tensile qualities, and its resistance to fire and chemicals, asbestos has been used extensively in building materials since before the turn of the century.

However, inhalation of asbestos fibers has recently been found to be a health hazard to humans, and building owners may be held liable for the presence of the fibers and subsequent inhalation by occupants. Due to these factors, a move is presently underway among building owners in both the public and private sectors to identify any asbestos-containing materials (ACM) in their buildings. This identification is accomplished by building inspections, which are the first step in a plan to effectively control and/or remove any known asbestos-containing materials found.

The main purposes of these inspections are identification of asbestos-containing materials, determination of the potential for exposure within each building, and generation of budgetary cost estimates for removal and replacement of asbestos-containing materials. Once the asbestos-containing materials are identified and assigned a Priority Level, their management should be addressed in a phased approach. A phased approach is designed to remove those materials possessing the highest exposure potential (and therefore posing the greatest health risk) first, and then to address the areas with successively lower exposure potentials.

Current EPA statutes address only presently friable (easily crumbled) materials. Nonfriable building materials do not create an environmental exposure unless they are sawn, broken, ripped, or pulverized. However, even materials that are well-wrapped and technically nonfriable at the time of inspection have the potential to become friable very readily by accidental tearing or other disturbance. It is for this reason, as well as to simply inform the owner of all asbestos-containing materials, that Hall-Kimbrell's policy is to address all materials which are <u>potentially</u> friable as well as those presently friable.

This report has been organized in a manner that presents the data in several forms to best suit the needs of the building owner. The Quality Control and Method of Quantification section explains our testing and quality control methods. The Synopsis of Anticipated Abatement Cost covers the options and estimated costs for abatement of asbestos-containing materials. The Petrographic Results section is a listing of samples taken and their asbestos content. The Spreadsheets contain detailed information on the locations, types, and quantities of all materials sampled and removal/replacement costs for all asbestos-containing materials.

II. BUILDING SURVEY

Mr. Lee Mostad, acting on the authority of McDonnell Douglas Corporation, authorized Hall-Kimbrell Environmental Services, Inc., to conduct a building survey and to analyze samples taken during the inspection.

On October 16, 1989 through November 30, 1989, Hall-Kimbrell Environmental Services, Inc., conducted an inspection of the Douglas Aircraft, C-6 Torrance Facility. The inspection was comprised of six elements:

1. A visual determination as to the extent of suspect materials and condition of these materials in the rooms, boiler/mechanical rooms, hallways, storage rooms, etc.

2. A physical "hand pressure" test for determining the condition of suspect materials.

3. Sampling and documentation of observable suspect friable materials (and nonfriable materials, when applicable) as per Environmental Protection Agency guidelines.

4. Measurement of all observable and friable suspect materials sampled to determine the quantity existing within the facility. The measurement may be by a visual area inspection and/or by blueprint examination.

5. Assessment of suspect cementitious and miscellaneous materials and their locations.

6. Determining and expressing the exposure potential in a numerical algorithm. Factoring of the algorithm is based on approximately twenty variables which contribute to the exposure potential.

The results of the survey integrated with the Polarized Light Microscopy with Dispersion Staining (PLM/DS) analysis of bulk samples taken are outlined in this document.

The Hall-Kimbrell Environmental Services, Inc., project manager who is responsible for the survey of the Douglas Aircraft, C-6 Torrance Facility is Cary S. Asper. If there are any questions regarding this report, please contact the Los Angeles Branch Office in Walnut, California, at (714) 594-3232 or the Lawrence, Kansas, office at (913) 749-2381.

III. PRIORITY LEVEL DETERMINATION

As a result of the inspection and laboratory analysis of the bulk samples taken, Hall-Kimbrell has generated an exposure number for each area in which asbestos-containing materials are present. These exposure numbers are generated from the Hall-Kimbrell algorithm, which is an expansion of the old EPA or Sawyer algorithm. While the six primary variables are identical to the Sawyer algorithm, there are two subvariables used to adjust the subjective score. The six primary variables are material condition, water damage, exposed surface area, accessibility, activity/movement, and air plenum/direct air stream. The two subvariables are asbestos content and friability. A numerical rating of each variable is assigned to the material and an exposure number is then calculated. The calculation procedure is: The numerical ratings of each of the six variables are added together. This sum is then multiplied by the numerical rating of the subvariable friability. Finally, this product is multiplied by the numerical value of the subvariable asbestos content. The result is the exposure potential, which is then categorized into one of four priority levels:

EXPOSURE POTENTIAL	PRIORITY LEVEL
60 - 162	Priority Level I
40 - 59	Priority Level II
20 - 39	Priority Level III
01 - 19	Priority Level IV

The lower the Priority Level number, the greater the potential of exposure to asbestos fibers.

Areas listed as Priority Level I generally contain materials which have been significantly damaged. Removal is the corrective action suggested for most Priority Level I areas. Removal costs for areas exhibiting extensive damage (Priority Level I) are not much higher than the cost of proper cleaning and repair. This cost differential will widen when dealing with the materials in the lower priority levels. Removal also eliminates future exposure incident which may cause the building owners to incur additional liability and is the only permanent solution to asbestos-related problems. Any past liability the building owner has incurred as a result of an occupant's exposure to the asbestos-containing materials will not be altered.

The areas found in Priority Level II do not have as high an exposure potential as those in Priority Level I; however, they still represent a significant exposure potential. Hall-Kimbrell recommends implementing a corrective action plan to reduce the high exposure potentials that exist in these areas.

Those areas classified as Priority Level III contain materials that have deteriorated to a point that some form of abatement is necessary to reduce the exposure potential. This abatement alternative may range from small scale removal to the rewrapping of pipes or the cleaning of debris from horizontal surfaces. No matter what the action chosen, the work should be completed in an organized manner so no further damage to the material is incurred, thereby creating an even greater exposure potential.

The areas listed as Priority Level IV contain materials which are not expected to create a serious or immediate exposure potential. However, as materials do deteriorate with time, a corrective action plan should be devised in order to minimize future asbestos exposure potential. The most effective means of reducing deterioration and accidental disturbances of asbestos-containing materials is the development of an Operations and Maintenance Plan. This is an interim control measure that is designed to train custodial and maintenance personnel, to establish emergency abatement and control procedures, to develop a periodical reinspection program of the materials, and to provide the necessary supplies and equipment to perform these tasks.

IV. THE LABORATORY

A. HALL-KIMBRELL LABORATORY QUALITY CONTROL PROGRAM

Hall-Kimbrell maintains an in-house quality control program in addition to participating in the U.S. Environmental Protection Agency Bulk Sample Quality Assurance Program. Our in-house program consists of blind reanalysis of five percent of all samples. This reanalysis is done by a designated Quality Control Microscopist. In addition, the Quality Control Microscopist reanalyzes the samples that were originally reported between trace and five percent asbestos. There is also voluntary quality control reanalysis and mandatory source material dependent quality control reanalysis for sample types that are particularly difficult to analyze.

B. METHOD OF ANALYSIS

Analysis is performed by using the bulk sample for visual observation and slide preparation(s) for microscopical examination and identification. The slides are analyzed for asbestos (chrysotile, amosite, crocidolite, anthophyllite, and actinolite/tremolite), fibrous nonasbestos constituents (mineral wool, paper, etc.), and nonfibrous constituents. Asbestos is identified by refractive indices (obtained by using dispersion staining), morphology, color, pleochroism, birefringence, extinction characteristics, and signs of elongation. The same characteristics are used to identify the nonasbestos constituents. The microscopist visually estimates relative amounts of each constituent using of a stereoscope if necessary.

The test results are based on a visual determination of relative volume of the bulk sample components. The results are valid only for the item tested. This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method of the determination of asbestos in bulk insulation samples. 40 CFR Ch.I Pt. 763, App A to Subpt. F.

C. REPORT FORMAT FOR PETROGRAPHIC ANALYSIS

The Petrographic Analysis form represents the laboratory results of the analysis of all materials suspected of containing asbestos. This form contains columnar data which represent the composition of each sample analyzed. The explanation of each column is provided.

Group Number: This number is assigned to a sample or group of samples taken from a single bulk material.

Sample Number: This is the heading for the column of unique sample numbers that run vertically down the form.

Analy: This is the number of the analysis type: "0" for the primary or entire sample analysis. This is the composite analysis of the subcomponents. "1" through "4" for the subanalyses of the separate components (if applicable).

Type: This describes the component that was subanalyzed.

Consistent: This column indicates whether the sample visually appears to be taken from the same source material as the other samples in the sample group.

Homo: This indicates whether the sample was homogenous or separable into subcomponents.

Color: This is the color code that describes the whole bulk sample.

Total Asbestos (Total Asb): This is a vertical column heading that indicates the total percentage by volume of asbestos in each sample.

Asbestos: This is a section of vertical column headings that identifies the type of asbestos in percentage by volume for each sample. The asbestos types and abbreviations are as follows:

CHRY	Chrysotile
AMO	Amosite
CRO	Crocidolite
ANT	Anthophyllite
TRE	Tremolite/Actinolite

Other Materials: This is a section of vertical column headings that identifies the remaining materials, binding or matrix materials. These materials are *nonasbestos-containing*. These components, in conjunction with any asbestos (if present), will add up to 100%. The abbreviations in the first four columns are as follows:

WOOL	Mineral/Glass Wool
CEL	Cellulose, Wood/Paper Fibers
MICA	Micaceous Minerals, Vermiculite
PER	Perlite/Pumice
BIND	Nonfibrous Binder/Filler

The codes that appear in the column headed with "OTHER" refer to a list of assorted uncommon materials. A list of these codes follows.

PETROGRAPHIC CODES FOR "OTHER"

AH	Animal Hair	GY	Gypsum
AN	Antigorite	HO	Hornblende
BR	Brucite	LZ	Lizardite
BI	Biotite	MF	Metal Foil
CA	Calcite	MV	Muscovite
CF	Ceramic Fiber	OP	Opaques
CG	Cellular Glass Foam	PL	Plastic
CO	Cotton	PT	Paint
CK	Cork	QZ	Quartz
DI	Diatoms	SF	Synthetic Fiber
DT	Dirt	SM	Synthetic Foam or Styrofoam
EG	Extruded Glass Fibers	TA	Tar
FA	Fly Ash	TL	Talc
FC	Fired Clay	VR	Vinyl Rubber
FE	Feather	WO	Wollastonite
GM	Granular Minerals		

The above legend is a reference to the two-digit codes found in the column called "other" in this document. Please refer to this page when decoding is necessary for clarification.

V. FINDINGS AND OBSERVATIONS

This survey encompassed 37 buildings at the C6 Torrance facility. These buildings surveyed are listed below:

Building #	Primary Use
1	Sheet Metal Fabrication
2	Fabrication
3	Administration Offices
4	Substation
11	Storage
12	Chemical Processing
13	Storage
14	Employee Store
15	Storage
18	Training Classrooms and Storage
19	Plant Protection
20	Transportation
23	Pump House
27	Pump House
29	Maintenance and Tooling
33	Chemical Storage
34	Maintenance/NC Control
36	Paint Storage
37, 37A, 37B	N/C Machines, Foundry, Programming
40	Chemical Storage
41	Boiler House
44	Pump House
54	Tooling Storage
55	Tooling Storage
56	Tooling Storage
57	Tooling
58	Storage
60	Radome Test Laboratory
60A	Radome Test Tower - West
60B	Radome Test Tower - East
61	Plastics
61A	Plastics
66	Manufacturing Support
66A	Storage (PM B)
67	Metal Bond

ASBESTOS MATERIAL PRESENT

The asbestos containing materials identified in this survey are discussed below by building. The location and quantities of these materials are displayed in the spreadsheets located in Appendix C. The composition of these materials are displayed in the petrographs located in Appendix B. It should be noted that this assessment was a non-destructive study and few destructive samples were collected. Before any specific renovation or demolition actually is started, a demolition assessment should be performed.

Building 1

Building 1 is a high bay corrugated metal structure with a basement, mezzanine, and tar built-up roof. The corrugated metal walls are covered with a fibrous/tar type of weatherproofing. There is an exterior area on the east side which is considered part of Building 1. The heating, ventilation, and air conditioning (HVAC) system is steam forced air. The HVAC lines are insulated with a magnesium silicate type of pipe covering and mudded joint packing (MJP). Debris from the pipe insulation is found on the catwalks. The ceilings in this building are covered with 1'x1' acoustical tiles, or are uncovered. The concrete floors are covered with 9"x9", or 12"x12" vinyl floor tile, or are uncovered.

Six types of ACM are found in Building 1; 9"x9" and 12"x12" floor tile, mastic, pipe covering, MJP, gasket material, and weatherproofing. Also sampled, but found negative for asbestos content were mastic, 1'x1' acoustical ceiling tiles, gasket material, roofing tar paper/roofing felt; and pipe covering servicing the chemical mill system.

The floor tile, mastic, and weatherproofing are all in fair condition, and categorized as priority level IV. The pipe covering, MJP, and gasket material have isolated areas of contact damage. The gasket material is categorized as priority level I. The pipe covering debris should be removed to prevent a potential fiber release. This material is also categorized as priority level I. The pipe covering and MJP throughout the building is categorized as priority level III, generally requiring corrective action only at isolated damaged areas.

Building 2

Building 2 is a high bay corrugated metal structure with several mezzanine areas and exterior patios. The corrugated metal walls are covered with a fibrous/tar type of weatherproofing. The heating, ventilation, and air conditioning (HVAC) system is steam forced air. The HVAC pipes are insulated with a magnesium silicate type of pipe covering or fiberglass and elbows with mudded joint packing (MJP) or fiberglass. The domestic water pipes which supply the restrooms are insulated with corrugated pipe covering and MJP. Transite flue pipes lead from the water heater closets to the roof. Batt-type insulation is found on the ceiling of three of the mezzanine areas. Other ceilings are covered with sprayed acoustical plaster, 2'x2' drop panels, 1'x1' non-suspect tiles, or are left uncovered. The floors are covered with 9"x9" and 12"x12" vinyl floor tile or are uncovered concrete.

Six types of ACM are found in Building 2; floor tile, mastic, pipe covering, MJP, weatherproofing, and transite piping. Also sampled, but found negative for asbestos content were mastic, sprayed acoustical plaster, 2'x2' drop ceiling panels, oven door rope, and batt-type insulation.

The floor tile, mastic, and transite piping are in good condition and categorized as priority level IV. The weatherproofing is in fair condition with isolated areas of contact damage near the ground and is categorized as priority level IV. The pipe covering and MJP on the domestic water pipes show signs of deterioration and are categorized as priority levels II and III, respectively. The pipe covering and MJP on the steam pipes have isolated areas of contact damage and are categorized as priority level II.

The damaged areas on the steam pipes should be addressed in the initial phases of a phased management plan.

Building 3

Building 3 is a three story brick and steel structure with a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is steam forced air. The HVAC pipes are insulated with corrugated or magnesium silicate type of pipe covering and mudded joint packing (MJP). In some areas, the pipes have been renovated and are now covered with fiberglass. The two fan/mechanical rooms found on the second floor contain pipe insulation and a vibration joint cloth (VJC). Ceilings are covered with sprayed acoustical plaster, 2'x4' drop panels, 2'x2' drop panels, and 1'x1' acoustical tiles. The floors are covered with 9"x9" and 12"x12" vinyl floor tile.

Eight types of ACM are found in Building 3; floor tile, mastic, batt-type insulation, sprayed acoustical plaster, pipe covering, MJP, VJC, and roofing tar paper/roofing felt. Also sampled, but found negative for asbestos content were floor tile, mastic, 1'x1' acoustical tiles, 2'x2' and 2'x4' drop panels, and a fire door. MJP on corrugated pipe covering and transite piping were assumed to contain asbestos.

The floor tile and mastic are in fair condition and categorized as priority level IV. The sprayed acoustical plaster is in good condition and categorized as priority level III, except for an area in the south stairwell of the third floor which shows signs of water damage and is categorized as priority level II. The batt-type insulation is in fair condition and categorized as priority level III. This material is located inside a fan enclosure which appears inoperative. If this fan is in fact operable, consideration of this material during the initial phases of a phased management plan is warranted, due to the air plenum that may cause disturbance. The pipe covering and MJP show signs of deterioration and are categorized as priority level II. The VJC shows signs of deterioration, including tears in the material, and is categorized as priority level I.

The water damaged sprayed acoustical plaster, the VJC, and the damaged areas of pipe covering should be addressed in the initial phase of a phased management plan.

Building 4

Building 4 is a single story brick structure with a tar-built up roof and concrete floor.

No asbestos containing materials (ACM) were found in Building 4. The tar built-up roof was sampled, but found negative for asbestos content.

Building 11

Building 11 is a five-story corrugated metal structure with a flat, tar built-up roof. The corrugated metal walls are covered with a fibrous/tar type of weatherproofing. The heating, ventilation and air conditioning (HVAC) system is hot water forced air and is located on the first floor. The HVAC pipes are insulated with fiberglass and magnesium silicate pipe covering with mudded joint packing (MJP). A portion of the first floor is covered with 12"x12" vinyl floor tile. All remaining floors are left uncovered.

Three types of ACM are found in Building 11, weatherproofing, pipe covering and MJP. Also sampled but found negative for asbestos content were 12"x12" vinyl floor tile, mastic, and roofing tar paper/roofing felt.

The pipe covering, and MJP, are in fair condition with isolated areas of contact damage which has led to some debris on the platform and floor. The weatherproofing is in fair condition with some areas of contact damage near the ground, and is categorized as priority level IV.

The pipe covering should be addressed in the initial phases of the management plan, and damaged areas should be repaired.

Buildings 12

Building 12 is a chemical processing and storage area surrounded by a chain link fence. No suspect asbestos containing materials were found in this area.

Building 13

Building 13 is a single story brick structure. No suspect asbestos containing materials were found in this building.

Building 14

Building 14 is a single story brick structure with a tar built-up roof and attic. The heating, ventilation, and air conditioning (HVAC) system is steam forced air and the pipes are insulated with a magnesium silicate type pipe insulation and mudded joint packing (MJP). Domestic water pipes are uninsulated. The ceilings are covered with 2'x4' drop panels and 1'x1' non-suspect acoustical tiles. The floors are covered with 9"x9" vinyl floor tile.

Five types of ACM are found in Building 14, 9"x9" vinyl floor tile, mastic, pipe covering, MJP, and roofing tar paper/roofing felt. Also sampled, but found negative for asbestos content were 2'x4' drop ceiling panels and mastic.

The pipe covering and MJP are presently in good condition and categorized as priority level III. The floor tile and mastic are in fair condition and categorized as priority level IV. The roofing material is in fair condition and categorized as priority level III.

Building 15

Building 15 is a single story brick and wood structure with a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is electric forced air and is located on the roof. The ceilings are covered with non-suspect ceiling tiles. Floors are covered with 9"x9" vinyl floor tile.

Two types of ACM are found in Building 15, 9"x9" vinyl floor tile, and mastic. Also sampled, but found negative for asbestos content was roofing tar paper/roofing felt. The floor tile and mastic are categorized as priority level IV.

Building 18

Building 18 is a two story wood structure with a basement. The roof is a tar built-up type. The heating, ventilation, and air conditioning (HVAC) system is gas/electric forced air. The ceilings are covered with sprayed acoustical plaster, and floors are covered with 12"x12" vinyl floor tile.

No ACM was found in Building 18. The sprayed acoustical plaster, 12"x12" vinyl floor tile, mastic, and the roofing tar paper/roofing felt were sampled and found negative for asbestos content.

Building 19

Building 19 is a single story brick structure with a tar built-up roof. There are four exhaust vents and one transite pipe on the roof. The exhaust vents are covered with a fibrous/tar type of weatherproofing. The transite pipe leads from the water heater to the roof. The heating for this building is externally supplied steam forced air. The steam pipes are insulated with a magnesium silicate type pipe covering and mudded joint packing (MJP). The ceilings are covered with 2'x4' drop panels. The floors are covered with 12"x12" vinyl floor tile or are uncovered concrete.

Seven types of ACM are found in Building 19; vinyl floor tile, mastic, pipe covering, MJP, roofing tar paper/roofing felt, transite piping and weatherproofing. Also sampled, but found negative for asbestos content were 2'x4' drop ceiling panels.

The floor tile, mastic, roofing material, transite piping, and weatherproofing are all in good condition, and categorized as priority level IV materials. The pipe covering, categorized as priority level II, and MJP, categorized as priority level III, are in good condition, but show some signs of contact damage.

The damaged pipe covering should be repaired in the initial phase of a phased management plan.

Building 20

Building 20 is a corrugated metal structure with a fibrous/tar type of weatherproofing. There is a partial second floor and a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is gas forced air. A vibration joint cloth (VJC) is found with the HVAC unit on the roof. Ceilings are covered with non-suspect ceiling tiles or left uncovered. Floors are covered with 9"x9" and 12"x12" vinyl floor tiles or are uncovered concrete.

Four types of ACM are found in Building 20, 9"x9" and 12"x12" vinyl floor tile, mastic, weatherproofing, and VJC. Also sampled, but found negative for asbestos content were mastic, and roofing tar paper/roofing felt.

The floor tile, mastic, and weatherproofing are in fair condition and categorized as priority level IV. The VJC shows signs of deterioration from weather exposure and is categorized as priority level I. The VJC should be addressed in the initial phases of a phased management plan.

Building 23

Building 23 is a single story brick structure with a tar built-up roof. Non suspect ceiling tiles are affixed to a thick paper insulation. The floor is uncovered concrete.

One type of ACM is found in Building 23, batt-type insulation. Also sampled, but found negative for asbestos content was roofing tar paper/roofing felt. The insulation is presently in fair condition and categorized as priority level III.

Building 27

Building 27 is a single story brick structure with a tar built-up roof. A thick paper insulation is found behind non-suspect ceiling tiles. The floor is uncovered concrete.

One type of ACM is found in Building 27, batt-type insulation. Also sampled, but found negative for asbestos content was roofing tar paper/roofing felt. The insulation is presently in fair condition and categorized as priority level III.

Building 29

Building 29 is a single story brick structure with a tar built-up roof. Vents covered with a fibrous/tar weatherproofing and transite piping are found on the roof. The heating, ventilation, and air conditioning (HVAC) system is steam forced air. The HVAC pipes are insulated with a magnesium silicate type of pipe covering and mudded joint packing (MJP). The ceilings in office areas are covered with 2'x4' drop panels. Floors are covered with vinyl floor tile, or are uncovered concrete.

Seven types of ACM are found in Building 29; floor tile, mastic, pipe covering, MJP, roofing tar paper/roofing felt, weatherproofing, and transite piping. Also sampled, but found negative for asbestos content was 2'x4' drop ceiling panels.

The floor tile, mastic, roofing material, weatherproofing, and transite piping are all in good condition, and categorized as priority level IV. The pipe covering, categorized as priority level II, and MJP, categorized as priority level III, are in fair condition. The pipe covering has isolated areas of contact damage and should be addressed in the initial phase of a phased management plan.

Building 33

Building 33 is a single story brick structure with a tar built-up roof and concrete floor.

No ACM was found in Building 33. The roofing tar paper/roofing felt was sampled and found to be negative for asbestos content.

Building 34

Building 34 is a two story brick structure with a tar built-up roof and an attic space on the second floor. The heating, ventilation, and air conditioning (HVAC) system is steam forced air and is located in the attic space. The HVAC pipes are insulated with a corrugated or magnesium silicate type of pipe covering and mudded joint packing (MJP). Some of this material has undergone abatement. However, some remaining debris was noted. These HVAC pipes enter the building on the second floor level of the west wall. Vibration joint cloths (VJC) are found in the attic space and on the roof. A portion of the ceilings on the first floor are covered with sprayed acoustical plaster. The second floor office area ceiling is covered with 2'x4' drop ceiling panels. The floors in this building are covered with 9"x9" and 12"x12" vinyl floor tile or are uncovered concrete.

Six types of ACM are found in Building 34; 9"x9" and 12"x12" vinyl floor tile, mastic, pipe covering, MJP, VJC, and roofing tar paper/roofing felt. Also sampled, but found negative for asbestos content were 2'x4' drop ceiling panels, and sprayed acoustical plaster.

The floor tile, mastic, and roofing material are presently in good condition, and categorized as priority level IV. The pipe covering, MJP, and VJC in the attic space are all in poor condition from contact damage and partial abatement. These materials are categorized as priority level II. The corrugated pipe covering and debris are categorized as priority level I. The pipe covering and MJP on the exterior of the building, and VJC on the roof, are in fair condition and categorized as priority level II.

The debris in the attic should be removed to prevent a potential fiber release. The abatement should be completed on the priority level I and II materials. The remaining priority level II materials should be addressed in the initial phase of a phased management plan.

Building 36

Building 36 is a single story brick structure with a tar built-up roof. Two exhaust units, located on the roof, are covered with a fibrous/tar type of weatherproofing. The heating, ventilation, and air conditioning (HVAC) system is steam forced air. The HVAC pipes are insulated with fiberglass. The floors are uncovered concrete.

There are two types of ACM in Building 36, roofing tar paper/roofing felt and weatherproofing. The roofing material is presently in fair condition. The weatherproofing on the exhaust units is in good condition.

Building 37, 37A, 37B

Building 37 is a corrugated metal structure with a tar built-up roof. The corrugated metal walls are covered with a fibrous/tar type of weatherproofing. A concrete and steel four story addition (37B) is located on the east side of the main building. The beams and columns in this addition are covered with two types of fireproofing. The heating, ventilation, and air conditioning (HVAC) system for this building is steam forced air. The HVAC pipes are insulated with a magnesium silicate type of pipe covering or fiberglass and mudded joint packing (MJP). The HVAC room, on the first floor east side, has hot and chilled water pipes. These pipes are insulated with fiberglass and MJP. Steam pipes on the roof are insulated with fiberglass and MJP. Ceilings in the office areas are covered with 2'x4' non-suspect drop panels, other ceilings are uncovered. Floors are covered with 12"x12" vinyl floor tile or are uncovered concrete.

Seven types of ACM are found in Building 37; 12"x12" vinyl floor tile, mastic, fire doors, pipe covering, MJP, fireproofing on beams, and weatherproofing. Also sampled, but found negative for asbestos content were MJP on non-suspect pipe covering, fireproofing on some columns, and roofing tar paper/roofing felt.

The floor tile, mastic, and weatherproofing are in fair condition, and categorized as priority level IV. The fire doors are in good condition, and categorized as priority level IV. The pipe covering and MJP are in fair condition with some signs of contact damage and are categorized as priority level III.

The fireproofing on the beams and structural supports in the first floor air handling room is in fair condition, with some areas showing initial stages of delamination. This material in an area which is subject to a strong air plenum which supplies air throughout the four story office structure. This material is categorized as priority level I, and should be addressed in the initial phase of a phased management plan.

The fireproofing applied to the beams above the ceiling throughout Building 37B is friable, and isolated areas of delamination was observed. Care should be taken when removing ceiling tiles as to avoid disturbing the material and/or debris. Generally, this material is in fair condition and has been categorized as priority level III. However, due to the signs of initial delamination, this material should be addressed in the initial phases of a phased management plan.

The fireproofing applied to the columns in this structure is identical to the material on the beams. However, pipe chases along the east side of the building have spray applied plaster on the walls and columns. This cementitious material tested negative for the presence of asbestos.

Building 40

Building 40 is a single story brick structure with a tar built-up roof. Vents located on the roof are covered with a fibrous/tar type of weatherproofing. The heating, ventilation, and air conditioning (HVAC) system is steam forced air and the pipes are insulated with fiberglass or are uninsulated.

One type of ACM is found in Building 40, weatherproofing on roof vents. Also tested, but found negative for asbestos content is the roofing tar paper/roofing felt. The weatherproofing is in good condition and categorized as priority level IV.

Building 41

Building 41 is a single story corrugated metal structure which contains four boilers that supply high pressure steam to other buildings in the facility. The corrugated metal walls are covered with a fibrous/tar type of weatherproofing. The steam and hot water pipes are insulated with a magnesium silicate type pipe covering and mudded joint packing (MJP). The tanks and boilers are also insulated with a magnesium silicate type of insulation, and gasket material is found on the boilers. The floor is concrete.

Steam is supplied to other buildings in the facility through pipes located in underground tunnels or suspended above ground. Access to the tunnels was not possible, however, abatement work in the tunnels was noted.

Five types of ACM are found in Building 41; boiler/tank insulation, pipe covering, MJP, gaskets, and weatherproofing.

Insulation on the north converter tank, pipe covering, and MJP are all in fair condition with isolated areas of contact damage and are categorized as priority level III. Insulation on the two remaining tanks also have isolated areas of contact damage and are categorized as priority level II. The weatherproofing is in fair condition with isolated areas of contact damage near the ground and is categorized as priority level IV. The gasket material is in good condition and categorized as priority level IV.

Building 44

Building 44 is a single story metal structure which contains the main fire protection pumping equipment. No suspect asbestos containing materials were found.

Building 54

Building 54 is a single story wood structure with a tar paper shingled roof. There is sprayed acoustical plaster and 12"x12" vinyl floor tiles throughout the building. The domestic water pipes are uninsulated.

Two types of ACM are found in Building 54, 12"x12" vinyl floor tile and mastic. Also sampled, but found negative for asbestos content were roofing tar paper/roofing felt, and sprayed acoustical plaster. The vinyl floor tile and mastic are presently in fair condition and categorized as priority level IV.

Building 55

Building 55 is a single story wood structure with an attic crawlspace and a tar paper shingled roof.

No ACM was found in this building. The roofing material was sampled, but found negative for asbestos content.

Building 56

Building 56 is a single story wood structure with a tar paper shingled roof. There is wallboard lining the interior walls.

No ACM was found in this building. The wallboard and roofing material were sampled, but found negative for asbestos content.

Building 57

Building 57 is a single story brick and corrugated metal structure with a mezzanine area. The corrugated metal roof is covered with a fibrous/tar type of weatherproofing and extends beyond the building to cover a storage area. The weatherproofing is also found on the corrugated metal portion of the walls. The heating, ventilation, and air conditioning (HVAC) system is steam forced air and the pipes are insulated with a magnesium silicate type pipe covering with no material on the elbows.

There are two types of ACM in Building 57, weatherproofing and pipe covering. The weatherproofing on the roof and walls is in fair condition, with isolated areas of contact damage near the ground, and is categorized as priority level IV. The pipe covering is in good condition and is categorized as priority level III.

Building 58

Building 58 is a three-sided corrugated metal structure. The corrugated metal roof and walls are covered with a fibrous/tar type of weatherproofing.

One type of ACM is found in Building 58, weatherproofing. This material is in fair condition with isolated areas of contact damage near the ground, and is categorized as priority level IV.

Building 60

Building 60 is a two story wood structure with a tar built-up roof. No suspect materials are found on the first floor. The ceiling on the South portion of the second floor is covered with 1'x1' acoustical tiles. The floors are covered with 9"x9" vinyl floor tiles on the South portion and 12"x12" on the North portion.

Two types of ACM are found in Building 60, 9"x9" and 12"x12" vinyl floor tile and mastic. Also sampled, but found negative for asbestos content were floor tile, mastic, 1'x1' acoustical ceiling tiles, and roofing tar paper/roofing felt. The floor tile and mastic in this building are in good condition, and are categorized as priority level IV.

Building 60A

Building 60A is a wood structure with partial walls and no roof. No suspect asbestos containing materials were found to exist in this building.

Building 60B

Building 60B is a single story wood structure with transite panels used for the West, North, and South exterior walls. The exterior walls are painted.

One type of ACM is found in Building 60B, transite panels. The transite panels are in fair condition with isolated areas of contact damage, and are categorized as priority level IV.

Building 61

Building 61 is a corrugated metal structure with a partial second floor and a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is steam forced air and pipes are insulated with a magnesium silicate type of pipe covering and mudded joint packing (MJP). Fan units are located on the roof. Domestic water pipes are insulated with non-suspect pipe covering and MJP. The floors in the main area are uncovered concrete, and the floors in the office areas are covered with floor tile.

Six types of ACM are found in Building 61; floor tile, mastic, pipe covering, MJP, gasket material, and vibration joint cloth (VJC). Also sampled, but found negative for asbestos content were acoustical panels and tiles, pipe covering, and MJP on non-suspect pipe covering, and roofing tar paper/roofing felt.

The pipe covering and MJP have isolated areas in poor condition from contact damage and are categorized as priority level II. The gasket material and vibration joint cloth are in fair condition and are categorized as priority level III. The pipe covering and MJP, which show signs of contact damage, should be addressed in the initial phases of a phased management plan.

Building 66

Building 66 is a single story corrugated metal structure with a tar built-up roof and a concrete floor. The heating, ventilation, and air conditioning (HVAC) system is gas forced air. The domestic water pipes are uninsulated.

No ACM was found in Building 66. The roofing tar paper/roofing felt was sampled, but found negative for asbestos content.

Building 66A

Building 66A is a single story wood structure with a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is electric forced air. The floor is covered with 12"x12" vinyl floor tile.

Three types of ACM are found in Building 66A; 12"x12" vinyl floor tile, mastic, and roofing tar paper/roofing felt. The floor tile, mastic, and roofing material are presently in good condition, and are categorized as priority level IV.

Building 67

Building 67 is a single story corrugated metal structure with a mezzanine and a tar built-up roof. The heating, ventilation, and air conditioning (HVAC) system is hot water/chilled forced air. The HVAC pipes are insulated with a magnesium silicate type of pipe covering and mudded joint packing (MJP). There are also steam pipes associated with the autoclaves and acid baths which have magnesium silicate pipe covering and MJP. A kettle and insulated wiring are found adjacent to the acid baths. The floors are covered with 12"x12" vinyl floor tile or are uncovered concrete. There is one area of 2'x4' drop ceiling panels in the mezzanine area.

Five types of ACM are found in Building 67; vinyl floor tile, mastic, asbestos cloth, electrical wire insulation, and MJP. Also sampled, but found negative for asbestos content were pipe covering and MJP, 2'x4' drop ceiling panels, and the roofing tar paper/roofing felt.

The floor tile and mastic in this building are presently in good condition, and are categorized as priority level IV. The asbestos cloth on the kettle and the electrical wire insulation both show some signs of deterioration, and are categorized as priority level III. The MJP on the non-suspect pipe covering in the second floor fan room are in fair condition with some material exposed due to contact damage and are categorized as priority level II. Debris from the MJP is also found on the fan unit and floor.

The debris in the fan room should be removed to prevent a potential fiber release. The damaged areas of MJP in the second floor fan room should be repaired in the initial phase of a phased management plan.

VI. SYNOPSIS OF ANTICIPATED ABATEMENT COST

The spreadsheets included in this report contain a breakdown of the budgetary cost estimates for each material, a total for each area, a subtotal for each building, and finally, a grand total for removal of all asbestos-containing materials and replacement with nonasbestos-containing materials of equivalent or better quality.

The estimated abatement cost is budgetary in nature, since there are many variables which will affect the final construction estimate. Once it has been decided which materials to address, either totally or in a phased fashion, a final estimated construction cost may be determined based on variables such as time frame for construction, type of replacement material chosen, occupancy during abatement, and size of project chosen. All budgetary estimates are based on removal and replacement with nonasbestos-containing materials. This option has been chosen because it usually represents the maximum expenditure, in the short run, that the owner would be making, as opposed to other temporary forms of abatement such as encapsulation or enclosure. Encapsulation is a temporary measure which will seal and, therefore, retard fiber release for only a limited period of time. However, the materials remain in the building and must be monitored periodically under an Operations and Maintenance Plan. If, however, the study identifies selected areas which we would recommend be encapsulated, enclosed, rewrapped, or otherwise temporarily enclosed, these are so noted in the specific comments and recommendations. There are no standard cost-estimating guidelines that can be used in this report to establish those estimates, since there are numerous variables that affect the final cost.

When attempting to provide a synopsis of the various options available in making an abatement decision, only general options or alternatives can be addressed. There are many combinations of areas and materials which may be addressed in any one abatement project. Historically, most building owners have chosen one of two types of projects:

1. Removal of All Asbestos-Containing Materials and Replacement with Nonasbestos-Containing Materials: This option is the most costly in the short run and may be the most difficult to pursue, considering the possible magnitude of the project, the associated funds which must be appropriated, and the difficulty of moving building occupants to allow for abatement of all materials in one project. However, this option will eliminate the asbestos exposure potential and any problems associated with the presence of asbestos-containing materials.

2. A Phased Abatement Program by Priority: In most cases, the most prudent decision is to remove the asbestos-containing materials on a phased basis, beginning with all of the Priority Level I materials or a combination of the Priority Level I and Priority Level II materials. This option allows the client to expend the first funds on those areas which present the most severe exposure potential. Exposure to any asbestos-containing material which remains is controlled under an Operations and Maintenance Plan until such time as those materials can be removed. In many cases, building owners will actually gear a phased abatement program to the priority level, so that Priority Level I materials are slated for removal the first year, Priority Level II materials will be addressed in the second year or second phase, Priority Level III materials in the third year or third phase, and so on.

Professional Fees and Other Expenses

In general building construction, the architect's estimate is used as a base figure, with contingency fees added to determine a total project cost figure. Contingency fees include unexpected bid fluctuations, last minute owner-requested change orders, and other changes that may not be anticipated. An asbestos project is no different; therefore, a 5 to 15 percent contingency should be added depending on the size of the project.

Professional fees must also be considered in the total project scope, since almost all abatement projects today must be designed and managed by a professional engineering or consulting firm specializing in this unique area. The fees for designing the project; developing the plans and specifications; conducting all the necessary prebid and preconstruction conferences; and providing contract administration, supervision and final clearance of the project are usually based either on a percent of the total construction cost (with the percentage dropping as the total cost of construction increases) or on a lump sum or "not to exceed" basis. The professional fees for managing and designing the project and ensuring it is being carried out under stringent, safe conditions could range from 5 to 8 percent for projects over one-quarter of a million dollars in construction estimate, to as high as 10 to 12 percent for much smaller projects. The fees are always exclusive of reimbursable expenses and travel-related costs.

On-site air monitoring and construction supervision is absolutely vital during an asbestos abatement project. Unlike the general construction project in which the architect or engineer checks on the job from time to time, the unregulated nature of the abatement industry requires constant vigilance to ensure that the contractor is complying with all aspects of the specifications, that the procedures are followed to the letter, and that sophisticated monitoring of not only the air inside the work area but also the air outside the work area and inside the building is carried out to be sure that asbestos fiber levels do not exceed safe levels. In addition, the air monitoring records provide the owner with solid information as to the ongoing safety of the project and can be used in a public relations program, since tenants or other building occupants are concerned about the "healthfulness" of their spaces during and after an asbestos abatement project.

The fees for an on-site air monitoring crew and an on-site laboratory for rapid analysis of these critical barrier and final clearance samples are either charged on a per shift basis or as a percent of the total construction cost, depending on the size of the project. They are usually separate from the architectural/engineering fees but may in some instances be combined into one contract with the architectural/engineering portion of the project. Regardless of the abatement alternative chosen, the cost for air monitoring, including construction supervision and management, will be approximately two (2) percentage points higher than the architectural/engineering fees. As a general rule of thumb, it can be estimated that the associated architectural/engineering fees, construction supervision, air monitoring fees, reimbursable expenses, will run approximately 15 to 17 percent of the construction cost for larger projects and could be as high as 20 to 25 percent of the construction cost for smaller projects.

In addition to professional fees during the actual project, there are other fees that may be associated with the asbestos abatement program. These include:

1. The cost of the asbestos assessment survey.

2. The cost to develop and maintain an Operations and Maintenance Plan to monitor asbestos-containing materials remaining in the building system.

3. The cost of relocation, in some instances, of employees and other building occupants during asbestos abatement.

4. Down time in productivity for personnel administering the asbestos abatement program.

5. Litigation assistance cost if a cost recovery lawsuit is planned to recover the cost of asbestos abatement from the manufacturers.

6. Other internal costs related to the program.

Once the asbestos management goals have been defined, a professional engineering abatement firm may be approached to provide a specific fee proposal.

VII. CERTIFICATION OF REPORT

The information contained in this document is based on physical inspections conducted by Hall-Kimbrell Environmental Services, Inc. We certify that the presence or absence of asbestos is based on the petrographic analysis of bulk samples taken during the survey.

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